SEPTEMBER 1961

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TECHNOLOGY DEPARTMENT

THE PAPER INDUSTRY

Colgar's new bleached kraft pulp mill

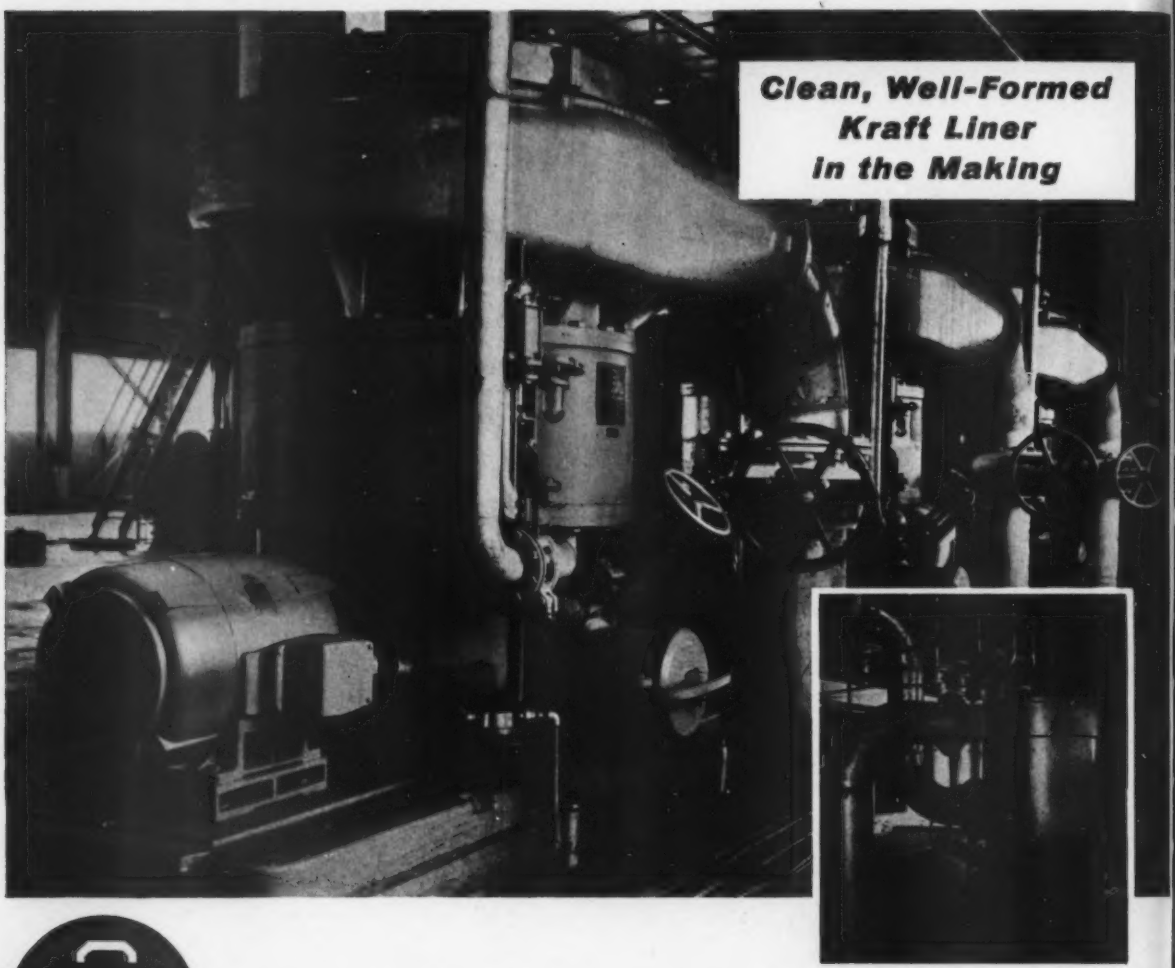
Pipe, fittings, valves and pumps in wastepaper recovery

The urge to merge

Hammermill installs Sandy Hill Kamyr wet machine

Behavior of coating mixtures on the machine

Publishers of PAPER AND PULP MILL CATALOGUE



Selectifier® Screens More than Double Wire Life Expectancy and Protect the Paper Machine at Tennessee River.

Three Model 36-P Selectifiers ahead of the primary pressure headbox and one Model 30-P on the secondary headbox of the new machine at Tennessee River Pulp & Paper Company, Counce, Tennessee, do the final cleaning and assure a completely dispersed fiber suspension for perfect sheet formation.

Result: Clean stock, excellent formation, extended wire life and protection against damage to the paper machine.

Selectifier Screens have been getting these same results for papermakers everywhere for 19 years... and over 2000 installations. Pressurized screening is a Black-Clawson development.

SHARTLE DIVISION
Middletown, Ohio
COMPLETE STOCK PREPARATION SYSTEMS

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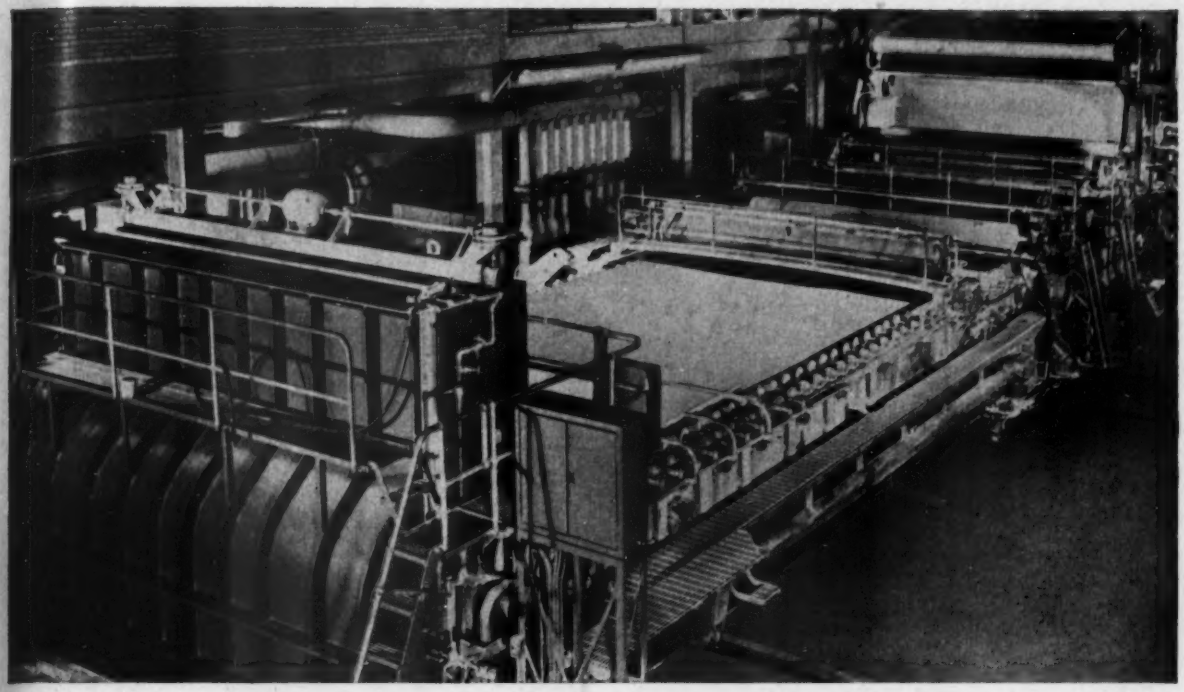

Talk About Rugged Individualism!

Any Fourdrinier machine is an individualist. To begin with, it's not something you buy off a shelf. Custom-made, each one's operating characteristics are all its own and like no other.

It is this very individuality . . . and the resulting potential it offers . . . that has inspired the constant research and development of *WISCONSIN* Fourdrinier Wires, which are as notably different from other wires as each machine is from other machines.

WISCONSIN Wires are custom-matched to the unique characteristics of your specific paper making machine. When the necessary characteristics of this "marriage" are satisfied, then, your machine will develop its full, built-in potential for the highest quality production at the lowest possible operating costs.

The addition of the new LEV-L-WEVE* to *WISCONSIN'S* full line of Fourdrinier Wires represents an important break-away from traditional Fourdrinier Wire application. LEV-L-WEVE offers many added advantages in wire life, production quality and lower operating costs. *WISCONSIN'S* specialized methods and machines have been developed in over 60 years of practical experience and continued research to supply the best in Fourdrinier Wires. Call or write, today, and a *WWW* representative will stop and tell you how *WISCONSIN* Fourdrinier Wires can help to produce dollar savings for your mill. Of course, there is no obligation to you.

*Patent Applied For.

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Another Mount Vernon Dryer Felt Success Story . . .

Mount Vernon was asked by a large Southern Kraft Mill how they could increase drying and dryer felt life expectancy on their #2 machine. WOODBERRY 403, a synthetic reinforced full faced asbestos dryer felt, was recommended and established a new record! WOODBERRY 403 ran 166 days as against the 127 day life run of the best of previous felts used. WOODBERRY 403 yielded an increase of 30%! This style contipues to give outstanding service under the severest operating conditions and repeatedly renders gratifying results.

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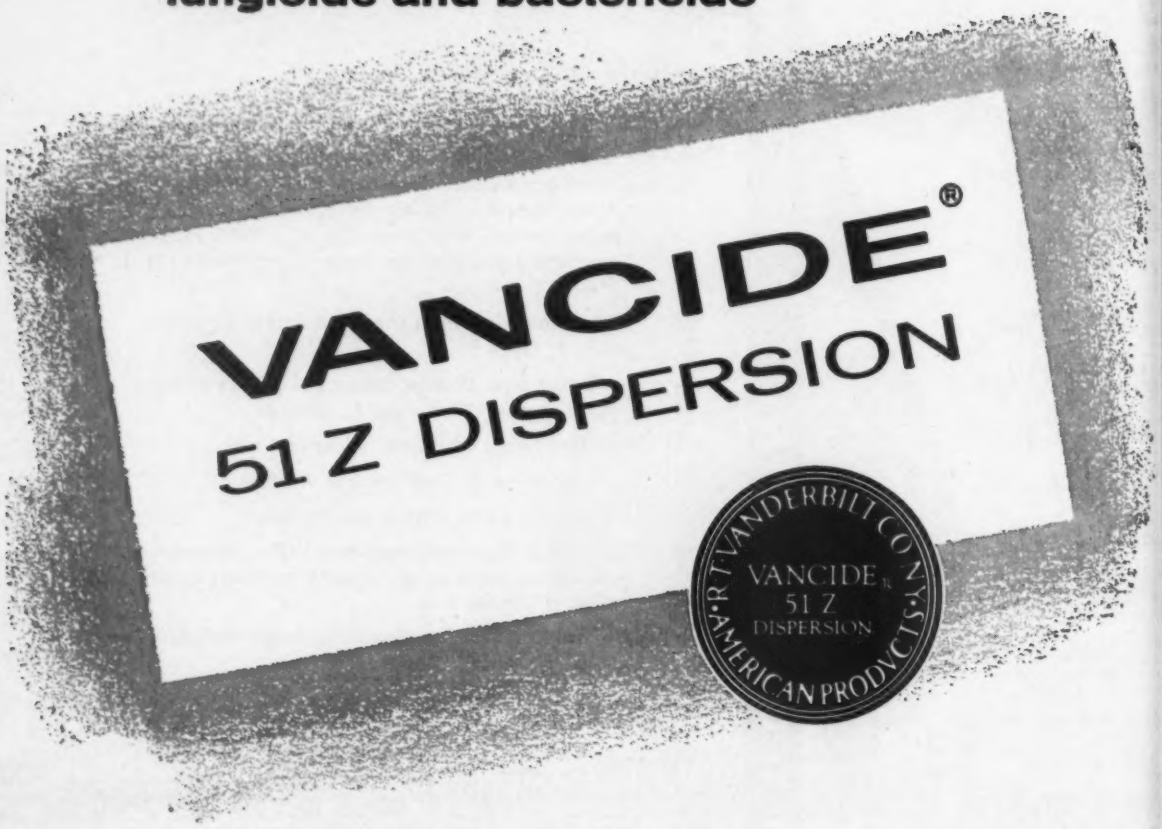
FRONT COVER — Celgar tugboat moves bundles of pulpwood within reach of gantry crane. See page 353.

A powerful and effective fungicide and bactericide



Safe for use as recommended as a Slimicide in Food Paper and Paperboard

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from our point of view

The practice of giving and using free engineering services

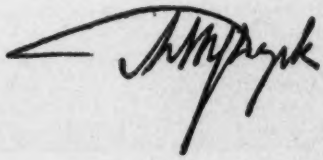
Recent concern expressed by some equipment manufacturers over the practice of giving and receiving free engineering services in connection with the design and manufacture of custom-built equipment, has prompted us to look into the situation and bring it to the attention of our readers.

The way a pulp and paper mill could accept free engineering services from suppliers of equipment is as follows: A paper mill may find itself in need of a machine to do a specific job that cannot be performed by any standard piece of equipment on the market. The mill then sends out process specifications to a number of equipment manufacturers who must do considerable pre-engineering in order to arrive at a workable design and accurate costs of such equipment. Usually, no individual design submitted by any supplier completely answers the mill's requirements. However, by making use of the various ideas submitted, the mill is able to complete the design it wants and may submit it to an equipment manufacturer who was not among those originally contacted. Since this manufacturer has no pre-engineering costs, he can usually underbid any competitor.

While the ethics of such practices are questionable, we have found in our discussion with suppliers and mill management that the majority view anticipates great difficulty in eliminating the use of free engineering from the industrial picture in our competitive economy.

This practice can be abolished only if all suppliers of equipment, without exception, should decide to charge the customer for any engineering services performed. Such a development, however, would seem unrealistic since many equipment suppliers look upon the giving of free engineering services as a normal and competitive procedure in a free economy.

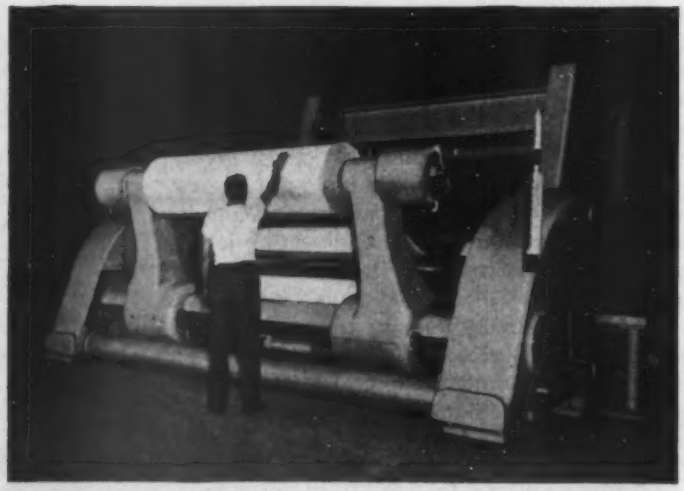
While it therefore seems impossible to abolish the practices of giving and using free engineering services, we feel that it would be in the interest of the pulp and paper industry to give serious consideration to placing its final orders with the supplier who has provided the best engineering job or whose specifications most closely answer the customer's requirements. It is only reasonable to conclude that the company who has done the best pre-engineering job on a certain piece of equipment must be the one most familiar with its design and therefore most qualified to manufacture it as a quality product. Usually he may also be expected, because of his familiarity with the design, to make the earliest delivery. Both of these considerations often out-weigh any cost differences in the submitted bids.



Ready for the roll. Notice the absence of a shaft. Roll is moved in between lifting arms which are then lowered and closed under pressure and then elevated to unwinding position.

LANGSTON SHAFTLESS UNWIND STAND

Boost your production . . . reduce your slitting and rewinding costs



Easy, fast, completely safe. One man does everything. Operating pushbutton controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by pushbutton control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths up to 140 in. and diameters to 84 in. For complete information, write Samuel M. Langston Co., Camden 4, N. J.

Langston LEADERSHIP . . . BY DESIGN

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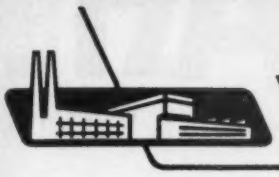
A New Firm to serve YOU



Paper Mill Suppliers, Inc.

KALAMAZOO, MICH.

for **SALES • SERVICE • TECHNICAL ASSISTANCE** *on*

DRI-TUFT
(needled)

DRI-WEAVE
(woven)

DRYER FELTS

Paper Mill Suppliers, Inc. has been founded by Frank Clawson who has more than eight years experience in dryer felt sales and service.

Foremost quality of quick-drying, longer-lasting dryer felts is assured, because *Dri-Tuft (needled)* and *Dri-Weave (woven)* dryer felts are manufactured by Albany Felt Company.

For dryer felts to meet your most exacting requirements write or phone today.

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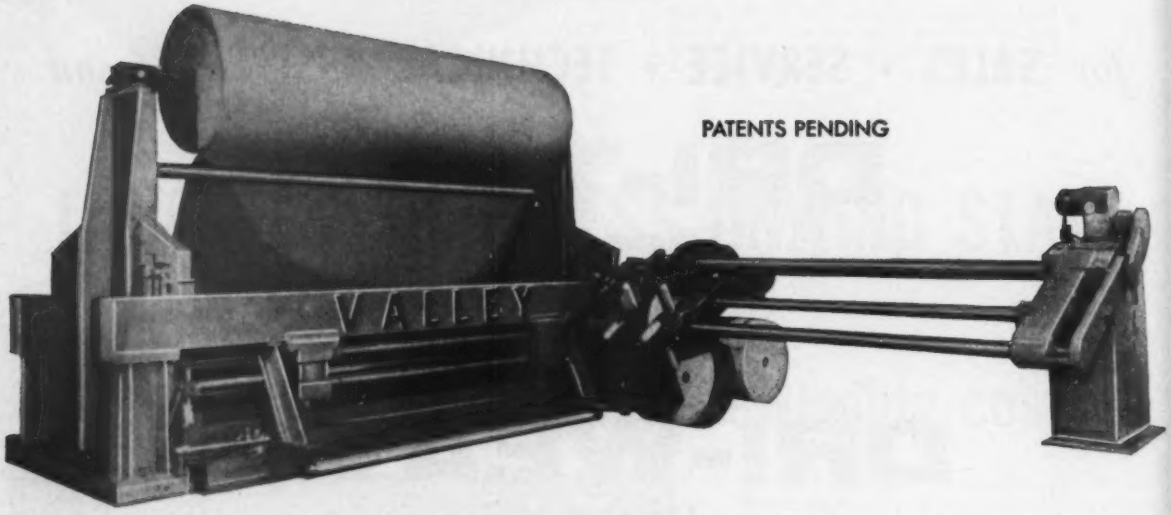
NEW and REVOLUTIONARY



PATENTS PENDING

wraps smoothly . . . faster . . . with minimum supervision . . . in smaller floor area . . . at lower cost

Each phase of automatic time cycle can be individually activated by turning control console selector switch to manual, and pressing individual operation pushbutton mounted on the console board.

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. . . ROLL-WRAPPING SYSTEM

wraps a roll AUTOMATICALLY in less than 1 minute!

ANOTHER VALLEY FIRST! Now . . . a completely automatic, flexible *right angle* packaging system. Cuts wrapping paper to required size without manual settings, wraps and crimps ends ready for gluing on headers (Can be varied to use inner heads only — combination of inner and outer heads — or an outer head only). Wraps single or multiple ply including vapor seals. Unique console-control system shown will wrap paper rolls of varying sizes, one after the other in face lengths of from 7″ to 112″, and 15″ to 42″ diameters (These are *not* limiting dimensions). Crimper head makes hard, firm, uniform pleat for tight packaging, thereby assuring ultimate consumer of a superior product from your mill. Space-saving system includes conveyors, roll wrapping machinery, glue system, roll headers, scales, crimpers, dispensers and cutters, and lowering devices. Eliminates need for expensive trimming machines, unsightly glue pots, and other inconveniences common to normal wrapping methods.

VALLEY

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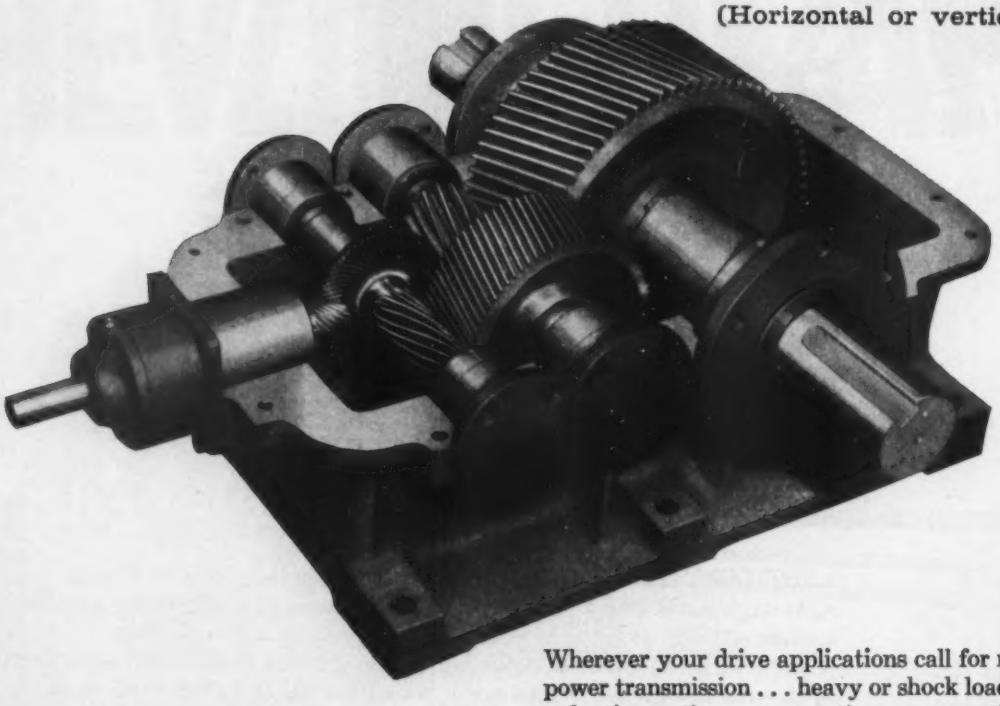
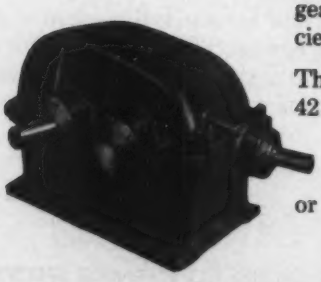
for economy plus efficiency, use spiral bevel-helical reducers on your heavy drive applications

(Horizontal or vertical type)



Wherever your drive applications call for right-angle power transmission . . . heavy or shock loads . . . high reduction ratios . . . continuous operation, D. O. James *spiral bevel-helical* reducers are the answer. They provide economy of initial cost, economy of maintenance, and economy of operation. The very high efficiencies of spiral bevel gears and helical gears combine to provide an over-all reducer efficiency in the range of 95%.



These D. O. James reducers are manufactured in 42 standard sizes, .2 to 637 hp, 6:1 to 358:1 ratios.

For complete specifications and selection data, call your local D. O. James representative or write for Catalog No. 43-C.

D. O. JAMES GEAR MANUFACTURING CO. 461
1140 West Monroe Street, Chicago 7, Illinois
Since 1888, every type of gear and gear speed reducer

D.O.James

...where you always get good gearing

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The DRYER FELT
they are all talking about—

The SCAPA
Synthetic Reinforced Cotton Dryer Felt
has been granted
U. S. Patent No. 2,882,933

FIRST TO LAST

Types 1166-S, 1164-S, 1464-S
2070-S and 2064-S are
Drying **more** paper **better**
every day

SCAPA known throughout the world wherever paper is made

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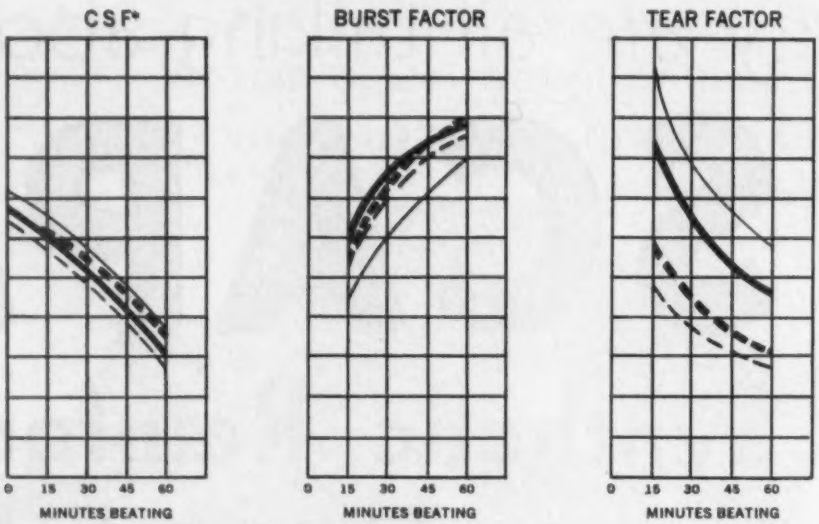
CELGAR KRAFT HAS BALANCED PROPERTIES

STRENGTH VALUES



*Canadian Standard Freeness

As shown by the above graphs, Celgar Kraft compares favourably with the world's best prime bleached kraft pulps in standard pulp tests.

In the all-important beating time to required papermaking freeness, it develops faster than other typical Canadian bleached kraft pulps, comparing favourably with the fast-beating Scandinavian furnish. This feature means high-volume output from repulping equipment at reduced power cost.

The bursting resistance of prime bleached Celgar Kraft exceeds or compares favourably with the best of its competitors while it is excelled only by West Coast bleached krafts in tearing resistance.

This unique and outstanding balance of properties at a high level can be achieved because of the Interior grown tree species used, the climatic conditions under which they grow and the modern process equipment installed in the new Celgar mill. These pulping characteristics, coupled with low beating time and good printability, place Celgar Kraft among the best bleached kraft pulps available in the world.

Distributors and agents for:

Celgar Kraft Pulps and Columbia Cellulose Viscose, Acetate and hardwood and softwood specialty sulphite paper pulps.

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1600 Dorchester Street West,
Montreal 25, P.Q.

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(*kraft and sulphite pulps*)
Columbia Pulp Sales Limited,
49 Old Bond Street,
London, S.W. 1.

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(*kraft and sulphite pulps*)
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Italy
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Italy
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Milan 508, Italy.

For information regarding other overseas agents please direct request to:
1600 Dorchester Street West, Montreal 25, P.Q.

V6834-1

COLUMBIA PULP SALES LIMITED

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CELGAR LIMITED MANUFACTURES BLEACHED KRAFT PULP

A. W. J. DYCK

Celgar's 500-ton/day capacity pulp mill — featuring two continuous Kamyr digesters and an airborne Flakt dryer — is successfully producing and marketing a high-quality bleached kraft pulp.

CELGAR'S new 500-ton daily capacity bleached pulp mill is now in full production as part of the $50 million investment by the company in woods, sawmill and pulp operations. Celgar Ltd. is a subsidiary of Columbia Cellulose Co. Ltd. Its product, a high quality bleached kraft pulp, is marketed primarily on the U. S. market by Columbia Pulp Sales, a subsidiary sales organization of Columbia Cellulose.

Among the special installations which contribute to the exceedingly successful operation of the new mill are: (1) woodroom operation, featuring a 60-ton capacity crane, two hydraulic barkers and horizontal chippers; (2) two continuous digesters of 300 ton daily capacity each; (3) a 5-stage bleach plant; (4) the largest recovery furnace in Canada; (5) an effective recausticizing system; (6) a fourdrinier with a 200-in.-wide wire (7) an airborne Flakt dryer; (9) a unique bale finishing system; and (3) maximum instrumentation of all processes.

Managing personnel of the new mill includes: T. N. Beaupre, president; A. H. Penney, executive vice president; J. M. Jopp, director of engineering; H. DeLuca, mill manager; J. T. Hegeman, production manager; R. A. Robinson, operating superintendent; O. T. Dalley, technical superintendent; J. H. B. Sawyer, plant engineer; and G. Selvig, woodroom superintendent.

Woodroom operation

The woodroom is designed to receive pulpwood: (a) in the form of bundles of logs from Celgar's woods operation — containing 10 to 15 cunits of solid wood — which make up the bulk of the company's pulpwood requirments and (b) as purchased logs arriving by rail or truck. Waste chips are blown from the adjoining Celgar sawmill, and unloading facilities will be provided for other purchased chips.

All pulpwood is picked up in bundles from the river and transferred to a breakdown deck by a 60-ton crane. Logs up to 24 in. in dia. are barked in a 30-in. hydraulic barker and are then chipped to ¾ in. size in a 112-in., nine-knife, horizontal chipper driven by a 1250-hp synchronous motor. Logs of 24 to 35-in. dia are barked in a 42-in. hydraulic barker and chipped in a 154-in., six-knife horizontal chipper driven by a 1500-hp motor. Both chippers are direct-connected to their driven motors.

The hydraulic barkers are of the ring type. The rotating inner barker ring is fitted with 8 nozzles designed to handle 1200 gpm of water at pressures of 1400 to 1700 psi. The rings rotate at a peripheral speed of 1800 fpm. The barker seal con-

T. N. Beaupre
President

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Exec. Vice Pres.

J. M. Jopp
Dir. Eng.

E. DeLuca
Mill Mgr.

J. T. Hegeman
Prod. Mgr.

O. T. Dalley
Tech. Supt.

sits of a plastic or micarta ring secured into the rotating portion which mates with a chrome-plated seal ring mounted in the stationary portion of the barker in such a way that it can float to keep in contact with the rotating portion of the seal. Under pressure the seal is hydraulically balanced allowing for a small leak to provide the necessary lubrication. Water, freed of silica by centrifugal cleaners and filters, is supplied to the barkers by 1600-hp turbine-driven, 1275-gpm pumps.

The chips are conveyed by a system of conveyors to two chip silos or to an outside chip pile. Screening of chips through four 5-ft. by 14-ft. three-deck screens takes place when the chips — whether from chip bins or outside storage — are on their way to the digesters.

All bark and wood waste from the breakdown decks, log conveyors, barkers, chip screens, etc., is combined and fed to a 42-in. ER58XL Mammoth Montgomery hog and a 51-in. wide bark press prior to being conveyed to the bark-burning power boiler. The Montgomery hog, driven by a 300-hp motor and equipped with a 36-in. dia. cutting circle, has a capacity of handling 300,000 lbs. of bark per day.

To minimize river pollution all drainage and effluent from the barkers, etc., is collected and screened through five vibratory screens and passed to a 100-ft. dia. clarifier before reentering the river.

Pulping operation

Chips are conveyed from the screens to hoppers supplying the pre-steaming vessels operating under a pressure of 18 psi. They then pass through the high-pressure feeders to the two 300-ton per day capacity continuous digesters which operate under a hydrostatic pressure of 165 psi. The continuous digesters feature: (1) cylindrical-slotted strainers at the top to strain the liquor from the chips and return it to the high pressure feeder system; (2) two heating zones from which liquor is removed through strainers and passed through indirect heat exchangers and then returned to the respective heating zones through separate pipes passing vertically down through the center of the digesters.

Both digesters are equipped with the diffusion-extraction and cold blow system which cools the chips with spent black liquor to approximately 210° F prior to leaving the digester. The cool black liquor enters the bottom part of the digester through two nozzles forcing the hot, high-solids cooking liquor through strainers and two flash tanks for heat recovery. The diffusion-extraction system has the advantages of (1) cooling the pulp to prevent cellulose degradation; (2) maximum heat recovery; (3) facilitating brown stock washing due to replacement of high-solids liquor; and (4) more economical evaporation of black liquor.

Pulp is blown continuously to a single blow tank of 75 tons capacity. From the blow tank, it is pumped to three enclosed Model A25K rotary knotters (knots are returned to the chip bins or hog storage by a pneumatic conveyor system) and to three 11½-ft. by 20-ft. brown stock washers. Stock from the third washer goes via high density storage tanks to the headbox of four Cowan screens and then to the screened stock chest which discharges directly to the 11½-ft. by 20-ft. brown stock decker. A No. 36-2 single rotating disc refiner driven by a 450-hp motor is used in conjunction with a secondary Cowan screen and two stages of Cycleans to recover the screen rejects.

The digesters are controlled from a graphic control panel. The washing operations are controlled from a console panel of vertical cubicle design — so located as to give the operator an unrestricted view of all washers.

An interesting feature is the measurement of stock consistency by the pipe drop method using a Transaire volumetric differential pressure transmitter. The line loss due to stock consistency in the flow line is measured. The resultant pneumatic signal is compensated automatically for flow variations and fed to a proportional plus reset controller to control the dilution valve.

Bleach plant

The sequence of the five-stage bleach system is as follows:

1. Chlorination stage, with an 18½-ft by 88-ft. upflow chlorination tower.
2. Caustic stage, with a 16½-ft. by 57-ft. downflow caustic extraction tower.
3. First ClO_2 stage, with a 19-ft.-9-in. by 82½-ft. upflow chlorine dioxide tower of acid-brick construction.
4. Second caustic extraction stage, with a 16½-ft. by 57-ft. downflow caustic extraction tower.
5. Second ClO_2 stage, with a 13-ft.-2-in. by 88-ft. upflow and an 18-ft.-8-in. by 82-ft. downflow chlorine dioxide tower of acid-brick construction. The split stage is connected by a screw conveyor at the top.

All towers are tile-lined. Each bleaching stage is followed by washing on a 11½-ft. by 20-ft. washer made of 317EL Type stainless steel. The five washers are equipped with reinforced polyester hoods. There are also a 5-ft.-7-in. dia. by 50-ft. high exhaust stack manufactured in one piece from ⅜-in.-thick reinforced polyester, venting towers, washer hoods and seal tanks.

From the last washer, stock goes to three Model 14 primary Centriscreens and a Model 10 secondary centriscreen, followed by 500 primary, 43 secondary, 8 tertiary, and 2 quarternary (4-in. size) cycleans. The screened stock then passes over an 11½-ft. by 20-ft. vacuum decker and to the machine blending tank equipped with three agitators.

Machine room

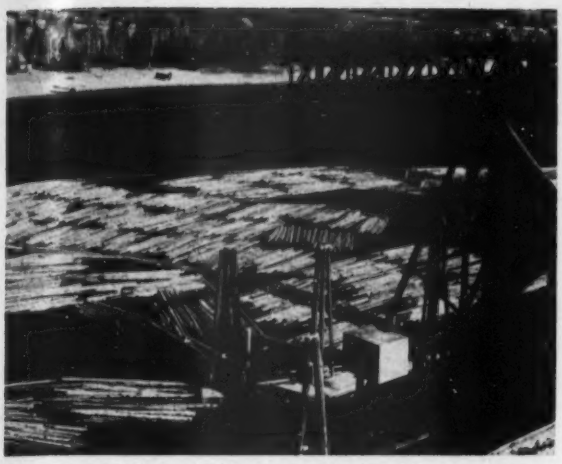
The fourdrinier-type machine is designed for speeds of 150 to 750 fpm. It is equipped with a stainless steel headbox featuring (1) single fishtail inlet header, (2) 3-pass design with adjustable vertical baffle between 2nd and 3rd press, (3) a perforated 12-in. dia. roll located at throat of slice, and (4) adjustable slice to provide opening from 1 to 5 in.

The fourdrinier is of cantilever design. It has a 200-in. wide wire, a 24-in. dia. breast roll made of centri-cast bronze, 30 rubber-covered 9⅛-in. dia. table rolls, four 12-in. wide oscillating suction boxes, a 10-in. by 34-in. Rotabelt, a 44-in. dia. couch roll with two suction boxes, two 16-in. dia. pneumatically loaded couch pressure rolls, and an 18-in. dia. driven dandy roll.

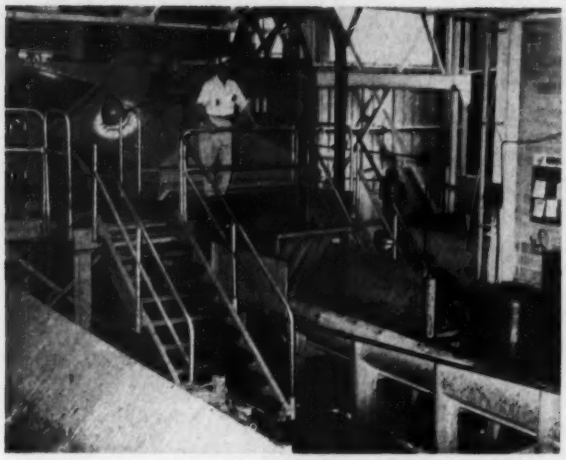
The press section consists of (1) the first press which has a 40-in.-dia. suction bottom roll and a 36-in. dia. top roll; (2) a second press identical to the first press; and (3) a third press which has a 40-in. dia., plain, rubber-covered bottom roll and a 36-in. dia. top roll.

Each press has six 11¼-in. dia. rubber-covered felt rolls with felt conditioners and stretchers. There are two 60-in. dia. predryers between the second and third presses.

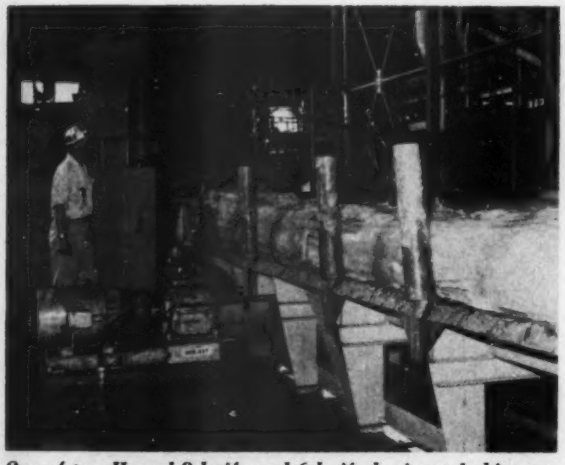
The machine is driven by sectional electric drives with power generated by main and auxiliary MG sets. The couch section, with its generator field controlled by a speed regulator to maintain a constant pre-set speed, acts as a master section for all other sections of the fourdrinier and presses. The couch roll is driven



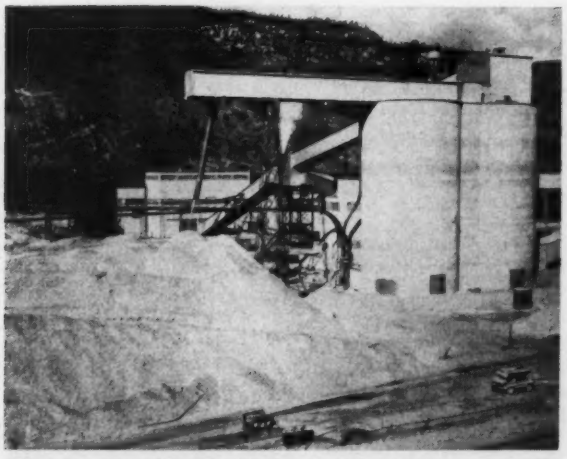
Gantry-type, 60-ton Colby crane lifts bundles of pulpwood from river.



One of two Hansel 30-in. and 42-in. ring-type hydraulic barkers.



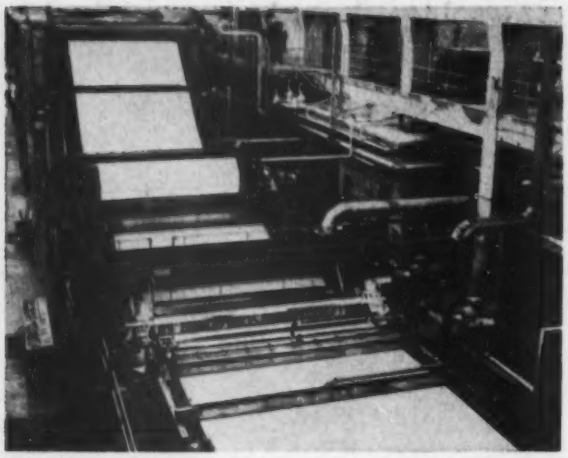
One of two Hansel 9-knife and 6-knife horizontal chippers.



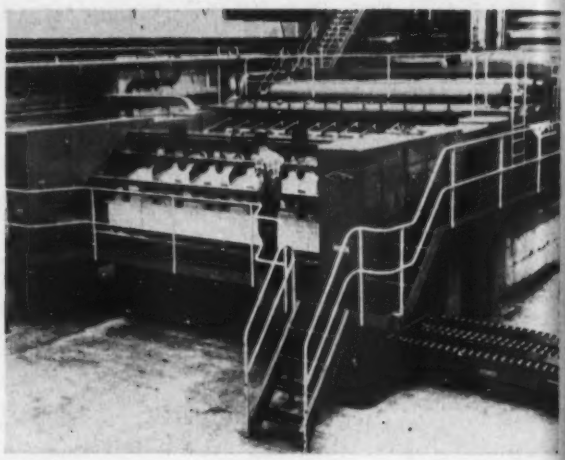
Chips are stored in two bins or in open storage.

Two Kamyr continuous digestors with blow tank. Also seen are five bleach towers.

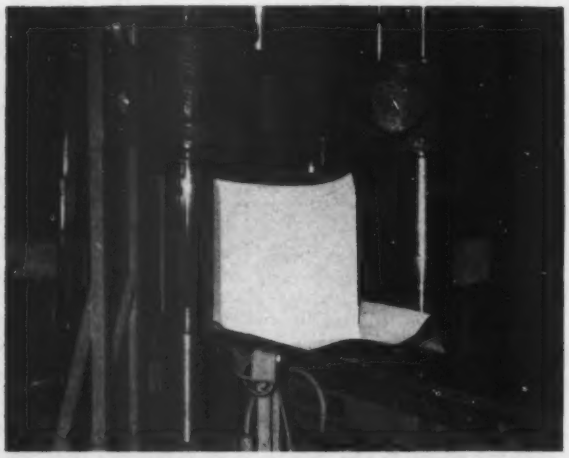
Chicago Bridge sextuple-effect evaporators are shown with aluminum jackets.



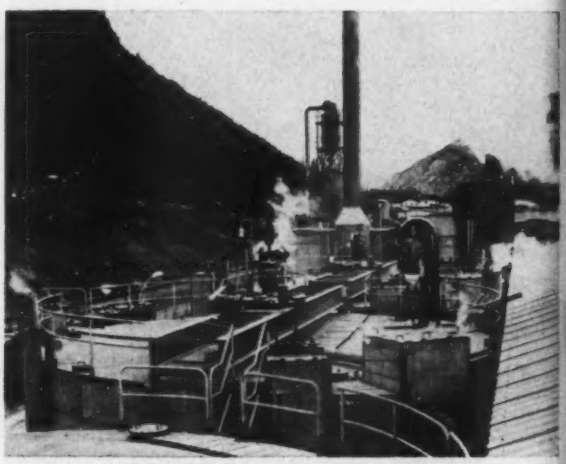
John Inglis 192-in. wide fourdrinier and S. F. Products airborne Flakt dryer.



Lamb-Grays automatic cutter layboy has dual drive arrangement.

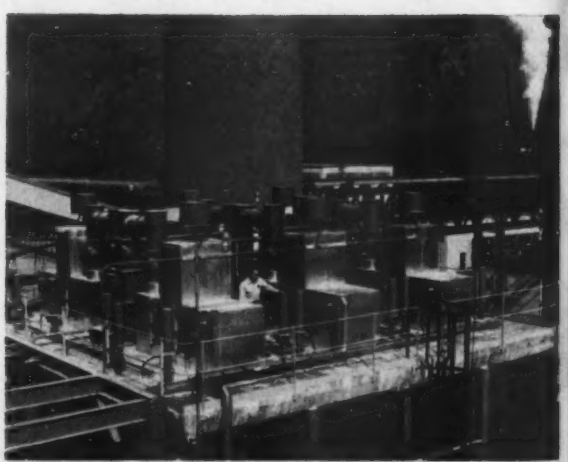


One of two Baldwin-Southwark 1000-ton bale presses.

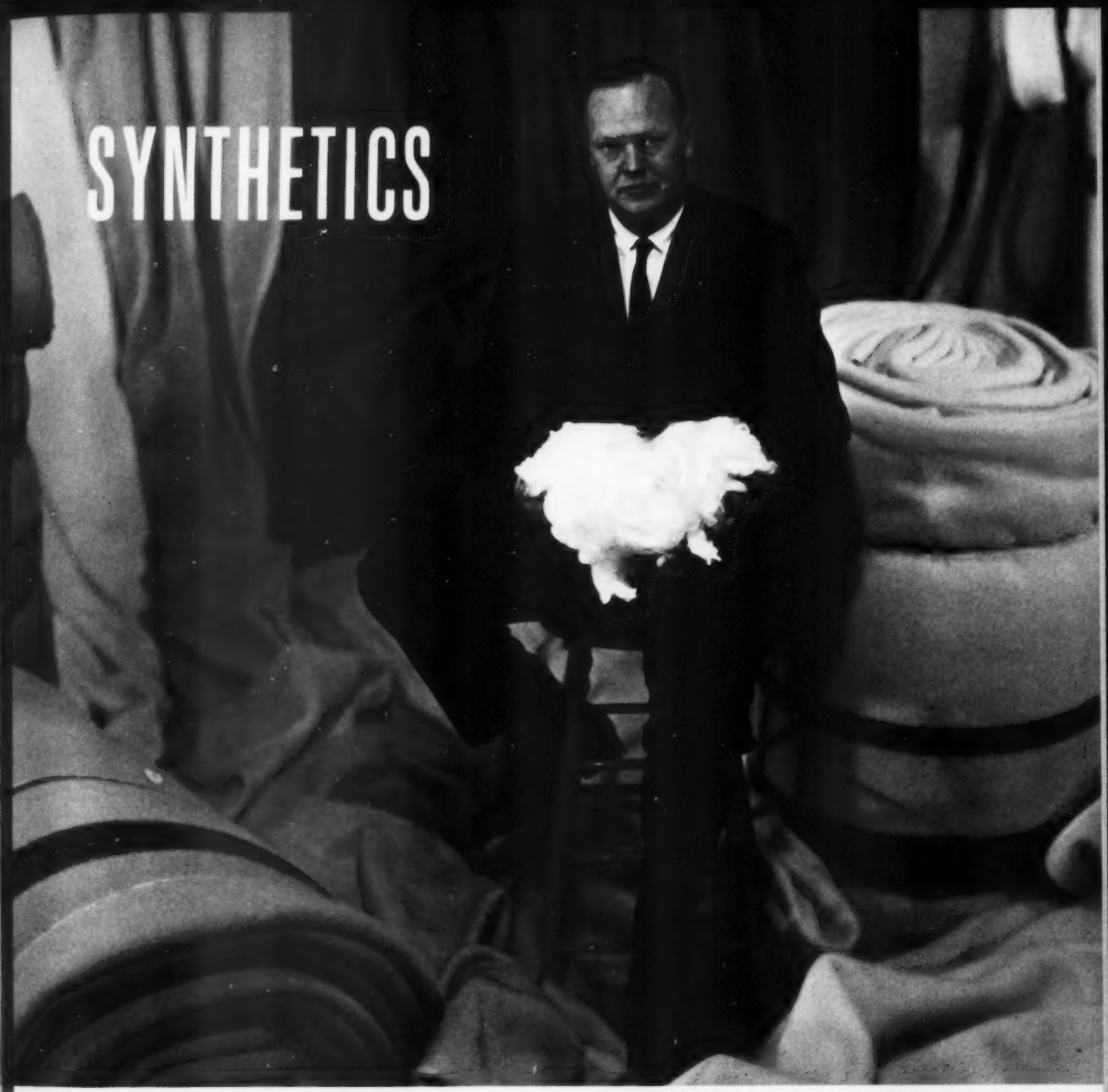


Compact installation of Dorr-Oliver causticizing system.

F. L. Smidth 10-ft. dia., 250-ft. long lime kiln.



Research-Cottrell electrostatic precipitator rated at 220,000 c/m gas.



Everett C. Reed, executive of Albany Felt Company, holds synthetic fibers against a background of varied styles of chemically treated, synthetic-content, paper machine felts.

How much is enough?

Knowing the *right* proportion of synthetic fiber to wool, for example, cannot be guesswork.

When you ask us to design and manufacture a felt, these questions must be answered and answered correctly: What do you want from a felt? What performance do you seek?

As a result of long experience in selecting and blending synthetics and wools, and after thorough study of results with thousands of synthetic-content felts in actual performances . . . Albany Felt, the pioneer in developing synthetic-content felts (we hold the original patent) can assure you of the highest skill in designing and building felts to fill your specific needs.

This means improved felt performance on your machine.

Today over 60% of our felts contain synthetic fibers . . . and we are the world's largest manufacturer of paper machine felts.

ALBANY FELT COMPANY
ALBANY, N.Y.
AF
Dedicated to Paper Industry Progress

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

TALK SYNTHETICS WITH YOUR ALBANY FELT SALES ENGINEER▶

The facts about SYNTHETIC-CONTENT felts

The most satisfactory synthetic fibers used in felts are Nylon and Dacron. The proper synthetic, carefully blended in the right amounts with the right wools and in the proper felt design, results in a felt that gives longer life and improved performance.

Albany Felt Company's long experience in synthetic-content felt manufacture has proved these facts:

- The percentage of synthetic fiber used in a specific type of felt varies with the individual paper or paperboard application involved. (Generally, the proportion is from 10% to 45%.)
- The amount of synthetic fiber recommended rises in proportion to the extent of punishment which the felt must endure.
- The percentage of synthetic fiber in a felt is not the sole answer to better-performing felts—the careful selection and blending of synthetics and wool, plus the right felt design are also most important.
- The careful and knowing selection of the proper chemical treatment, in conjunction with synthetics, often assures longer felt life, improved finish and performance.

MOST IMPORTANT FACT OF ALL . . .

When the "rights" are added together—the *right* design, the *right* fibers, and the *right* blending—the felt will be *right* for your requirements.

TALK SYNTHETICS WITH YOUR ALBANY FELT SALES ENGINEER

ALBANY FELT COMPANY
ALBANY, N.Y.

AF

Dedicated to Paper Industry Progress

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

Principal equipment installed at Celgar Ltd.

Consulting engineers: H. A. Simmons Ltd.

Woodroom operations

Bark hog, 42 in., Montgomery with 300-hp motor ..... Jacksonville Blow Pipe Co.
Bark press, 51 in. ..... Fibre Making Process Inc.
Barker effluent clarifier system, 100 ft. dia. ..... Process Engineering Inc. Eimco Process of Canada Ltd.
Barkers (2), hydraulic, one 30 in. and one 42 in., ring type, ring fitted with 8 nozzles ..... Hansel Mfg. Co.
Chip blowing system, with 300-hp blower ..... Rader Pneumatics & Engineering
Chip feeders, rotary, 17-ft. dia. ..... Chain Belt Canada Ltd.
Chip screens (4), 5 ft. by 14 ft., 3-deck ..... Thomas A. Dillon Ltd.
Chippers (2), horizontal, one 112 in., 9 knife, driven by a 1250-hp motor, and one 154 in., 6-knife, driven by a 1500-hp motor ..... Hansel Mfg. Co.
Cleaners, centrifugal, for removal of silica from water going to barkers ..... Canadian Ingersoll-Rand Co.
Gantry crane, 60-ton cap., for log-bundle handling ..... Colby Crane & Mfg. Ltd.
Pumps (2), 1275 gpm, driven by a 1600-hp turbine, for water supply to the barkers ..... Klaen-Schanzlin-Becker
Rechipper, 36 in., 10-knife ..... Canadian Sumner Iron Works
Woodroom log-handling equipment ..... Letson & Burpee Ltd.

Pulping and brown stock washing

Agitators, in chests etc. ..... James Brinkley Co.
Black liquor oxidation ..... Lundberg Ahlen
Brown stock washers (3), 11½ ft. by 20 ft. ..... Sherbrooke Machineries Ltd.
Centrifugal cleaners ..... Canadian Ingersoll-Rand Co.
Conveyor system, pneumatic ..... Rader Pneumatics Inc.
Cowan screens (4) ..... S. W. Hooper & Co.
Digesters, continuous (2), 300-ton/day cap., operate at 165 psi, equipped with diffusion-extraction system ..... Kamyr Inc.
Knotters (3), enclosed, rotary, Model A25K ..... Sherbrooke Machineries Ltd.
Pre-steaming vessels, 18-psi ..... Kamyr Inc.
Pumps ..... Bingham Pump Co.
Refiner, No. 36-2, single rotating-disc, driven by a 450-hp motor ..... Sprout Waldron & Co.
Tanks ..... Horton Steel
Ventilation & Exhaust Systems ..... S. F. Products Canada Ltd.

Bleaching and stock refining

Acid-brick construction ..... Stebbins Engineering & Mfg. Co.
Caustic extraction towers (2), 16½ ft. by 57 ft. ..... Horton Steel
Centriscreens (4), three Model 14 primary and one Model 10 secondary ..... Bird Machine Co.
Chlorination tower, upflows, 18½ ft. by 88 ft. ..... Horton Steel
Chlorine dioxide tower (3), one for 1st stage, 19 ft. 9-in. by 82⅛ ft., upflow; one for 2nd stage, 13 ft.-2 in. by 88 ft., upflow; and one 18 ft. 8-in. by 82 ft. downflow ..... Kamyr Inc.
Cycleans, 500 primary, 4-in. size; 44 secondary, 4-in. sizes; 8 tertiary, 12-in. size; and 2 quarternary, 7-in. size ..... Bird Machine Co.
Deckers (2) ..... Sherbrooke Machineries Ltd.
Pumps ..... Bingham Pump Co.
Tile construction ..... Service & Erection Co.
Ventilation, complete ventilation, and polyester hoods, ⅜-in.-thick polyester ..... S. F. Products Canada Ltd.
Washers (5), 11½ ft. by 20 ft. of 317 EL-type stainless steel, reinforced polyester hoods ..... Sherbrooke Machineries Ltd.

Machine room

Bale handling and finishing system, consisting of precision automatic cutter and layboy, swing table, storage conveyor, Airfloat scale plate, stacker conveyor etc. ..... Lamb-Grays Harbor Co. Inc.
Bale presses (2), 1000 tons ..... Baldwin-Southwark
Drives, sectional electric with MG sets, Canada General Electrical Co.
Dryer section, 123-ft.-long, SF Type "L' Flakt dryer using airborne system, equipped with automatic feeding and threading apparatus. Evaporates 57,000 lb. of water per hr. ..... S. F. Products Canada Ltd.
Felt rolls (6), 11½-in. dia., rubber-covered with felt conditioners and stretcher rolls ..... John Inglis Ltd.
Fourdrinier, 150 to 750 fpm, 200-in. wire, four 12-in.-wide oscillating suction boxes, one 10-in. by 34-in. Rotabelt ..... John Inglis Ltd.
Headbox, featuring single fishtail inlet header ..... John Inglis Ltd.
Hydrapulper, for broke processing ..... Black-Clawson Canada Ltd.
Predryers (2), 60-in. dia., between second and third presses ..... John Inglis Ltd.
Press section, 1st and 2nd and 3rd presses driven by 100-hp. motors ..... John Inglis Ltd.
Pulp machine drive, Harlund ..... Bepco Canada Ltd.
Vacuum pumps ..... Roots-Connersville Blower
Ventilation and exhaust system ..... S. F. Products Canada Ltd.

Recovery and recausticizing system

Causticizers (3), 15-ft. dia. bv 10-ft. deep with tank of ½-in. shell and bottom ..... Dorr Oliver Long Ltd.
Chemical ash tank pumps ..... De Laval Co.
Clarifiers (2), Type A3TB, white liquor, 35 ft. dia. by 25 ft. deep and one type "A" special green liquor, 40 ft. dia. by 15 ft.-deep ..... Dorr Oliver Long Ltd.
Evaporators, sextuple effect system, featuring patented internal preheaters in each effect, 420,000 lbs/hr capacity ..... Chicago Bridge & Iron Co.
Filter, Type 14FIC, 6 ft. by 8 ft. lime mud, handling 10 tons of dry lime mud per hr. ..... Dorr Oliver Long Ltd.
Hot lime bucket elevator and drag conveyor ..... Jeffrey Mfg. Co.
Lime kiln, 10 ft. dia. by 250 ft.-long, driven by a 75-hp, 4-speed, squirrel-cage motor ..... F. L. Smidth
Peabody scrubber ..... Peabody Engineering Corp.
Precipitator, wet bottom, rated at 220,000 cfm gas ..... Research Cottrell Inc.
Pumps (7), four No. 6W caustic-type; two No. 2VM caustic-type; and one 2-in. Type "L" filtrate pump ..... Canadian Pumps Ltd.
Recovery furnace, burns 1,800,000 lbs of dry solids per 24 hrs. Steam generating capacity 224,000 lbs per hr at 600 psi, equipped with turbine-driven induction draft fans ..... Combustion Engineering Inc.
Recovery boiler sootblower system, automatic sequential air motor driven, including 24 retractable units ..... Diamond Power Specialty Corp.
Recovery boiler combined oxygen and combustible recorder ..... Bailey Meter Co., Ltd.
Salt cake silo ..... Horton Steel Ltd.
Slakers, No. 10 ..... Dorr Oliver Long Ltd.
Steam air heaters ..... American Standard Products
Steam soot blowers ..... Diamond Specialty Corp.
Washers (2), one Type ATBHB white mud washer, 35 ft. dia. by 25 ft. deep; and one Type "A" dregs washer, 22 ft. dia. by 10 ft. deep ..... Dorr Oliver Long Ltd.

Power Plant

Air compressors ..... Canadian Ingersoll-Rand Co.
Deaerator ..... Graver Ltd.
Dust collector ..... Priecip. Co. of Canada
Flow transmitter and indicators, for metering distribution steam flows ..... Bailey Meter Co. Ltd.
Gas burners ..... Peabody Engineering Corp.
Hog fuel feeders ..... H. A. Simons Ltd.
Power boiler, 285,000 to 350,000 lbs of steam per hr. cap. ..... Foster Wheeler Corp. Ltd.
Sootblowers, manual, four rotary and two stationary blowers ..... Diamond Power Specialty Corp.
Steam turbine drives ..... Canadian Westinghouse Co.
Water treatment system ..... Cochrane Corp.

Instrumentation

Control instruments and panels ..... Taylor Instrument Co.
Control valves ..... Taylor Instrument Co. and Fisher Governer Co.
Process contro., pulp and chemical, featuring Taylor Pipe Drop Method and using Transaire volumetric differential pressure transmitter ..... Taylor Instrument Co.

by a 150-hp motor and each of the three presses by a 100-hp motor.

Pulp is dried in a SF Type "L" Flakt dryer which operates on the airborne system carrying the pulp sheet on high-velocity air jets. The 123-ft. long dryer is designed to evaporate about 57,000 lbs. of water per hour with production rates of 550 short tons per day. It is equipped with automatic feeding and threading apparatus and a heat recovery system for preheating the air necessary for the drying processes and for heating the mill's process water.

The Flaket dryer section motors are controlled by dancer roll rheostats to maintain sheet tension. A single generator supplies power to inlet and outlet motors.

Pulp bale finishing system

This custom-designed system begins with a precision automatic cutter which perforates, slits and cuts a 194-in. sheet into either wrappers or 29 by 32-in. bale-sized sheets. A dual cutter drive arrangement enables the operator to shift from cutting bale size sheets to cutting wrappers without interruption of machine operation.

The cut sheets are delivered to the layboy boxes by two sets of tapes and stacked while the layboy's main table is automatically lowered at a required rate to maintain the top of the sheet at the proper stacking height. After a pre-set number of sheets has been delivered to the boxes, a discharge cycle is automatically initiated during which a series of fingers mounted on a moving carriage supports the sheets which continue to be stacked in the boxes while a series a relays, solenoid valves and limit switches automatically control the discharge of stacked sheets to the powered swing table which in turn discharges them to the storage conveyor.

The storage conveyor is equipped with a wrapper pick-up unit which adds the bottom pulp wrapper to the bale while it is being transferred to the Airfloat scale where the bale is brought to its desired weight. The weighed bale is then transferred by means of a scale discharger unit to either of the two press feed plates. The scale operator controls the selection of either of the two pressing stations. The press feed and discharge conveyors, as well as the press platens, are equipped with the Air-float system.

Following the two 1000-ton press lines, there are two "Twistlock" tying lines which discharge the finished bales to the stacker feed conveyor. The stacker feed conveyor delivers the bales to the elevator stacker which is capable of forming stacks up to six bales high. A series of photoelectric cells and limit switches control the loading of the stacker feed unit as well as the feed and discharge of the stacker. The stacked bales are discharged from the elevator conveyor to the stack scale conveyor which takes them to a scale equipped with a printing mechanism to weigh and automatically print the weights.

Transfer conveyors, lift trucks, etc., then handle the bales to the storage areas.

Chemical recovery and recausticizing system

Black liquor from the digesters and brown stock washers is evaporated in a sextuple effect evaporator system which features patented internal preheaters in each effect to stabilize the operation and improve operating economy. In addition, provision is made in the evaporator design to permit by-passing any effect for cleaning, repair or maintenance purposes while operation continues at full capacity with slightly higher steam consumption. Conservation of heat is further obtained by reuse of the condensate produced from the evaporation process. The evaporators have an evaporating capacity of 420,000 lbs. per hour at an economy of 5.14 lbs. of water per pound of steam used.

Concentrated black liquor is burned in a recovery furnace designed to burn 1,800,000 lbs. of dry solids per 24 hrs. It is the largest recovery furnace installed in Canada and has a steam generating capacity of 224,000 lbs. per hr. at 600 psi pressure and 750° F at the superheater outlet. It is equipped with turbine-driven induction draft fans.

The gases leaving the recovery boiler pass through a wet bottom precipitator rated at 220,000 cfm gas. The precipitator is equipped with opzel collecting plates and loop-ring supported, weighted, stainless steel discharge wires. Rappers and controls are provided for the collecting and distributing plates, and a Syntron electromatic vibrator system for cleaning the discharge electrodes. The tile-shell precipitator, designed for horizontal gas flow, is energized by means of silicon rectifier transformers controlled with the Cottrel Automation System.

The highly efficient Dorrco recausticizing system consits of:

1. A No. 10 lime slaker.
2. Three No. 15 causticizers, 15 ft. dia. by 10 ft. deep, with tank tank of ½ in. shell and bottom.
3. A type A3TB mechanizm white liquor clarifier, 35 ft. dia. by 25 ft. deep, with tank and trays of ½ in. plate.
4. A Type ATBHB white mud washer, 35 ft. dia. by 25 ft. deep, with tank and trays ⅜-in. plate.
5. A Type "A" special green liquor clarifier, 40 ft. dia. by 15-ft.-deep, with a ⅜-in. tank.
6. A dregs mixer, 8 ft. dia. by 7 ft. deep, with tank of ½-in. shell.
7. A Type "A" dregs washer, 22 ft. dia. by 10 ft. deep with tank of ⅜ in. shell.
8. A Type "AP" lime mud agitator, 28 ft. dia. by 20 ft. deep, with tank of ⅜-in. shell.
9. Four No. 6W caustic-type pumps.
10. Two No. 2VM caustic-type pumps.
11. A Type 14FIC 6-ft. by 8-ft. lime mud filter which handles 10 tons of dry lime mud per hr.
12. A 48-in. by 60-in. vacuum receiver.
13. A 48-in. by 60-in. moisture trap.
14. A 2-in. Type "L" filtrate pump.
15. A Type H-9 vacuum pump with drive.

Lime mud is reburned in a 10-ft. dia. by 250-ft. long kiln carried on 4-tire and roller supports and driven by a 75-hp, 4-speed, squirrel-cage motor. The kiln features a chain system designed to assist in transporting material through and minimize formation of mud rings. The kiln also has a Ferris wheel feeder and a pusher feeder which are synchronized with the speed of the kiln. A gas scrubber is designed with an enlarged humidifying section and extra spray to pre-scrub the gases ahead of the impingement baffle plates.

Power plant

The power boiler has a steam generating capacity of 285,000 to 350,000 lbs. of steam per hr. at 600 psi pressure and 750° F at the superheater outlet. It is designed to burn waste wood and bark in combination with gas or oil and is equipped with: (1) five variable-speed rotary feeders which proportion the hogged fuel to the pneumatic spreader stokers for distribution over the sloping pinhole grates and; (2) eight ring-type gas burners. The boiler also features a multiclone dust collector, a cinder return system and a pneumatic ash disposal system.

Distribution steam flows are metered by flow transmitters and indicators.

Continued on page 367

THE USE OF PIPE, FITTINGS, VALVES AND PUMPS IN THE PULP AND PAPER INDUSTRY

ROLAND L. ALLEN JR.
Vice President, Eastern Engineering Co.

Part XV — Application of pipe, fittings, valves and pumps in waste paper recovery

THE RECOVERY of waste paper is a broad field and covers the processes required to convert the recovered waste paper to a usable furnish for the production of more paper. Its most important phases, from a process standpoint, are pulping, cleaning, deinking and bleaching. Which phase or phases are employed depend upon the characteristics of the waste paper available and the paper that is to be made from the furnish.

In the United States, waste paper is an important source of raw material for the paper industry and in the future it will become even more important. The majority of the waste paper recovered today is used in papers that are of lower quality than that of the original paper. This will undoubtedly be true for many years, but with modern techniques, waste papers can frequently be up-graded for furnishes for higher qualities than that of the original paper. At present, the upgrading of waste paper is not always economical, but in the future it is likely to prove attractive.

The most simple system consists of the pulping of clean waste paper for use in a furnish where no cleaning, deinking or bleaching are required. Such a system would require no other equipment than a pulper, a pump and a storage chest and would be the exception rather than the rule.

A very complex system would require cooking, deinking, washing, screening, cleaning, and three stage bleaching where unbleached printed waste paper was used for the preparation of a bleached furnish.

Materials depend on condition

In general, the same materials of construction are indicated at the various points in the waste paper recovery system that would be used at similar points in a regular pulp mill. Where product contamination is critical, materials that will not cause contamination should be used. Where corrosive conditions are present, materials that will give an economical service life should be used.

In general, materials of construction may be cast iron or carbon steel for unbleached furnishes, but should probably be stainless steel or similar materials for bleached furnishes.

For either unbleached or bleached furnishes, the pulping, cooking, deinking and washing processes are usually alkaline for the removal of size, resins, fillers, coatings and inks. The alkalinity is relatively moderate, but usually sufficient to allow the use of mild steel construction materials. For these systems, piping may be carbon steel; valves may be all cast iron or cast iron with stainless steel trim; and pumps may be all cast iron or stainless steel fitted cast iron.

After deinking and washing of the pulp for unbleached furnishes, the same construction materials mentioned above may be used. For bleached furnishes, the washed pulp should be handled in suitable non-contaminating materials such as stainless steel before bleaching.

The type of bleaching employed is, of course, dependent upon the characteristics of the waste papers used and of the desired furnish. Chlorination, caustic extraction, hypochlorite bleaching, peroxide bleaching and hydrosulfite bleaching have all been employed.

Chlorination requires the use of carbon steel for the handling of dry chlorine; Saran-lined steel, glass, glass-lined steel, polyvinyl chloride, polyvinyl-chloride-lined steel or similar materials for the handling of wet chlorine; and rubber-lined steel, polyvinyl-chloride-lined steel or similar materials for the handling of chlorinated stock and white water.

Caustic extraction requires the use of carbon steel for handling the caustic solution and type 304 stainless steel for the handling of the stock and white water.

Hypochlorite bleaching requires the use of Saran-lined steel, or similar materials, for handling the hypochlorite solution and type 316 stainless steel for the handling of the stock and white water.

Peroxide bleaching requires the use of type 316 stainless steel for the handling of the bleach solution, stock and white water.

Hydrosulfite requires the use of type 316 stainless steel for the handling of the bleach solution, stock and white water.

In general, the piping, valve and pump materials of construction are the same for waste paper recovery systems as for similar systems described in more detail in previous chapters, and the types of valves and pumps required are also the same.

Installation cost should be a guide

The use of waste paper is attractive where it can supplant virgin pulp in the furnish at a savings. In order that this may be accomplished, the cost of the waste paper used, the operating and maintenance costs of the waste paper recovery systems and the fixed costs resulting from the capital investment for the waste paper recovery systems, must total less than the cost of virgin pulp. In order that this end be served, the capital investment must be kept to a minimum consistent with the production of the required quality of waste paper furnish and reasonable operating and maintenance costs. A considerable portion of the investment is for piping, valves and pumps. Therefore, construction materials must be selected that will have the lowest installed costs consistent with the corrosive nature of the particular service and the cleanliness requirements of the particular furnish.

The installed costs (rather than the cost of the materials alone) are important since some materials that are low in material cost are high in installation costs with a resulting high installed cost for the system.

PLATE-TYPE HEAT EXCHANGERS REDUCE FUEL BILLS

PULP AND PAPER mills across the country have proven the advantages of plate-type heat exchangers in heat recovery systems. Harnessing that old profit-eater, waste energy, through plate heat exchangers, has sizeably reduced fuel costs in many plants.

At the new hardwood sulfite mill of Finch, Pruyn & Co., Glenn Falls, N.Y., a compact plate heat exchanger was installed in the drain line for spent black liquor. The unit transfers 5.4 million BTU's per hour to incoming tap water.

In Catawba, S.C., the Bowaters Carolina Corp. installed stainless steel plate exchangers to recover over 40 million BTU's per hour. Cost of the units was recovered in less than nine months.

Consolidated Water Power & Paper Co. in its Wisconsin Rapids plant recovered 10.8 million BTU's per hour through use of a plate heat exchanger.

A plate heat exchanger, as compared to the conventional shell-and-tube type, consists of a pack of standard-size plates — acting as heat-transfer surfaces — plus a frame to support the plates. The product and cooling/heating medium flow between these plates alternately.

Recent improvements in their mechanical design, with particular emphasis on higher operating pressures, plus improvements in basic rubber formulations and other gasketing materials used, have increased the adaptability of these heat exchangers.

The standard elements that make up heat transfer surfaces is one of the basic features of plate heat exchangers. The various liquids pass between these elements, or heat transfer plates, in relatively thin layers. This allows any combination of flow passes for either liquid flow stream.

Plate heat exchangers need less space

Plate heat exchangers provide a tremendous area of heat transfer surface in a much smaller space than the tube-and-shell units. The De Laval model installed at Finch, Pruyn & Co. mill requires an area of less than 3 by 12 ft. Consolidated Water's De Laval exchanger is 8 ft. long, 6 ft. high and less than 3 ft. wide.

The space-saving feature of plate heat exchangers looked particularly attractive to Bowaters Carolina Division. Their exchangers are in the pulp digestor blow steam recovery system. This system requires less surface since the entire quantity of blow steam need not be condensed and cooled during the scheduled blow-down period. The job of cooling the condensate to reclaim heat is carried out continuously during the 3- to 4-hr. period between blows.

Flexible plate arrangements meet changing needs

Plate heat exchangers can be individually tailored to meet the requirements of a paper mill's problem and material. Complete freedom of plate arrangement permits plate changes in product velocity at any point in the unit. This flexibility also lets the designer take complete advantage of the product's physical characteristics at different temperatures.

Plates in these heat exchangers are normally pressed from stainless steel sheets. The corrugated type of plate design provided by this type of profile not only imparts turbulence to the liquid flow but also adds appreciably to the plate's strength.

Bowaters Carolina checked the performance of plate-type exchangers at other plants before ordering them for its Catawba mill. They installed two Model P151-1B units, each capable of heating 408,750 lbs. per hour of process water. In combination, they recover over 40.8 million BTU's per hour of operation —

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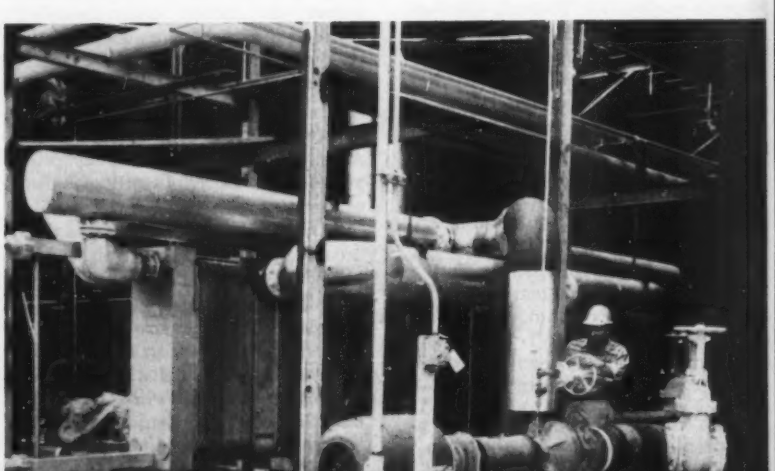


Stainless steel plate type heat exchangers at Bowaters Carolina mill in Catawba.

THE URGE TO MERGE

WARREN B. BULLOCK

In seeking to gain greater efficiency in production and distribution of its output, there has been a marked trend in the industry toward integration and merging of operations.

SINCE the first of the year four major paper manufacturing companies have entered the retail merchandising field, thereby opening a new chapter in the history of mergers in the paper industry, by which big companies are acquiring others to become bigger and little companies are uniting to hold their own.

Entering the distribution field

The Champion Paper & Fibre Co., Mead Corp., Kimberly-Clark Corp., and Hammermill Paper Co. have acquired old time distributing companies, giving them approximately 80 retail outlets. Hitherto it has been the merchant who has distributed the product of the mills to the ultimate consumer.

Champion by its acquisition of the Carpenter Paper Co., Mead of Chatfield & Woods, Hammermill the retail business of the Western Newspaper Union and Kimberly-Clark of Blake Moffitt & Towne, have entered the retail distributing field from Pennsylvania to the Middle West and the Pacific Coast.

What this means to the paper industry is expressed by an important executive whose company is not participating in this form of industrial expansion. H. Willing Pepper, a vice-president of Scott Paper Co., announced that his company had no intention of acquiring any wholesale distributors, but would continue to market its products through the independents.

"The trend of merchant acquisitions will probably continue," Mr. Pepper is quoted as saying. "The principal unfavorable effect may be that some mills may become desperate to find outlets and in their search may decide to start selling direct. On the other hand, it is my firm belief that the remaining hard core of independent merchants will provide adequate outlets for the independent mills."

As is the case with the Scott company, International Paper Co. will continue to market through independent merchants. Lamar M. Fearing, newly elected president of International, in his first public statement since his election to that post told the Merchants Advisory Committee of International's fine paper division that his company will continue to sell its mill brand and allied grades of printing, writing and industrial papers through the independent merchants.

From the side of the merchants themselves came the comment of William F. Obear, president of the National Paper Trade Association. He said that paper mills which sell direct and bypass the paper distributor are missing thousands of sales calls annually, "Assuming," he said, "that each merchant salesman either visits personally or writes a letter to a very conservative five customers a day, and multiplied by twenty working days a month, you get the staggering total of 1,700,000 sales contacts made by National Paper Trade Association members each month."

Trend continues

These radical developments have been only the latest examples of the industry's "urge to merge" which has been becoming more and more evident in recent years.

A Federal Trade Commission report in 1956 listed thirty mergers in the paper and allied fields in that year, and the tendency to expand by the merger route has increased since that time. This figure merely accentuates the extent to which the paper industry has moved toward consolidation in recent years.

Uncle Sam has looked with a jaundiced eye on many such mergers, but in general the mergers have been horizontal, companies combining to produce comparable, but not identical, papers by a central organization. The other type of merger has been the vertical, in which companies have expanded to give them a complete coverage of the field from forest to pulp and paper mills, then to conversion of paper into bags and boxes, and now even to the distribution of their product to the public.

Mergers within the paper industry seldom come within the purview of the Anti-Trust laws. There is always the question whether in the long pull a concentration of industry into major units does not eventually result in providing a cheaper product to the public. Mass production has been a characteristic of the American economy and has done much to make the nation outstanding in its ability to provide the public with the luxuries as well as the necessities of life.

In some of the instances in which the Department of Justice has acted to break up groups of merged companies, the problem of dissolution of operating companies is comparable to an effort of unscrambling an omelet. In some pending cases before the Government officials, an attempt is being made to break up companies which have been in combined operation for years. One such case is the demand by the Government that Union Bag-Camp Corporation dissolve the merger of two old companies after five years of integrated operation, and also to divest the central corporation of several originally independent bag companies. In most of these cases the acquired bag manufacturers had secured their basic paper from Union Bag. Millions are involved in this case, the merged corporation having a worth of over $200,000,000. Another instance is the expansion of Scott Paper Co., essentially a producer of sanitary papers, where

the Government complains about the acquisition of other companies. One such acquired company makes high grade wrapping papers, another pulp, and still another a variety of grades but with large timberland holdings in the South which Scott needed for its overall operations.

Some companies, such as St. Regis and Mead, have combined horizontal and vertical expansion.

The attempt by the Government to dissolve relations between Dupont and General Motors has been in the Federal Courts for years. No more rapid solution of action against paper companies would normally be expected.

Two great expansions

A feature of the merger-expansion type of development is the manner in which two giants of the industry, International and Crown Zellerbach, have invaded the territory formerly dominated by the other. International has been the outstanding producer in the Northeast and South, as well as Canada, with converting affiliates on the Pacific Coast. International paid the equivalent of close to $100,000,000 to acquire the enormous Pacific Coast holdings of the Long Bell Lumber Company in order to provide the pulpwood needs for a projected mill in the Far West, at an additional cost of tens of millions.

Crown Zellerbach, second largest paper company in the world, has been the monarch of the Pacific Coast, with a subsidiary in New York state to produce sanitary papers. Crown Zellerbach, however, has invaded the territory of its eastern rival by joining with the Time-Life publishing group to build a multi-million dollar paper mill in the deep South, for the production of magazine paper from hard woods as well as southern pine. Crown further entered the South by acquiring the Gaylord Container Co., maker of bags and boxes, with seven huge paper machines at Bogalusa, La., as well as smaller paper mills in Ohio and converting plants at nearly a score of cities in a dozen states.

Reverse type of merger

While there has been great expansion as between paper companies themselves, there has been a reverse type of merger by which corporations not basically in the paper industry have taken over paper and paperboard mills to round out their plans for comprehensive coverage of the packaging and similar fields.

Among these mergers have been those of the two chief companies in the packaging field, American Can Co. and Continental Can Co. American Can acquired control of the $161,000,000 Marathon Paper Co., an outstanding producer of wrapping papers, and food boards, such as those for butter cartons, and also acquired the Dixie Cup Co. Continental Can Co., likewise, took control of Robert Gair Co., an outstanding paperboard and shipping container producer, an action which, incidentally, came under Federal Trade Commission criticism.

Olin Mathieson Co., best known as a producer of chemicals, not only became interested in glass containers but absorbed the Ecusta Paper Co., the world's largest cigarette paper manufacturing company, with its mills in the North Carolina national forest area. The company also bought a plant in the Pisgah National Forest, N.C., for the manufacture of cellophane, and a five machine paper mill in Louisiana.

An interesting type of merger was that under which the Diamond Match Co., originally a manufacturer of paper match books and wooden matches and match boxes, entered the paper field. The company broadened its operations to become a manufacturer of molded pulp food dishes, then went into the packaging field by the absorption of the Gardner Board and Carton Co. of Ohio, changing its name to the Diamond Gardner Co. The company then added the United States Printing and Lithographing Co. to its holdings, again changing its name to the Diamond National Corp., a $155,000,000 organization.

Another similar reverse type of merger was the entry of the Standard Packaging Corp. into the paper field, acquiring the Eastern Corp. of Maine and its subsidiaries, the Fonda Container Co. and the Royal Lace Paper Co. Standard also took over control of the Chemical Paper Mfg. Co. of Holyoke, Mass.

The Georgia Pacific Co. a lumber operating concern entered the paper manufacturing field by building its own kraft pulp and paper mill and has announced plans for a further investment of $30,000,000 in a similar field.

The St. Regis expansion

In the direct field of paper mill expansion, the broadening of the area of St. Regis Paper Co. is especially striking. This company had its birth in the historic paper making district of Watertown, N.Y., and was at one time a factor in the newsprint manufacturing field. From this type of production St. Regis went over into the related area of what is known in the industry as groundwood printing paper, closely related to newsprint. The company now has no less than ten kraft paper, board and pulp mills in Florida, New York, Wisconsin, Washington, Ohio and Pennsylvania, twelve multi-wall paper bag mills in eleven states, and four mills making fine and high grade printing papers.,

Three of the principal corporate acquisitions were the Cornell Paperboard Products Co. of Wisconsin, the Schmidt & Ault Paper Co. of York, Pa., and the Rhinelander Paper Co. of Wisconsin, a manufacturer of greaseproof papers. The company is also a heavy stockholder in a Canadian corporation producing newsprint and kraft papers. Most of these mergers were accomplished by the exchange of St. Regis stock, with the added companies operating as divisions of the parent corporation. Extension of absorption of converting and merchandising outlets continued at such a high rate that in 1960 St. Regis arranged to exchange 1,400,000 shares of its stock for either of the converting corporations.

A most significant phase of the St. Regis expansion was its early domination of the field for the manufacture of multi-wall paper bags used for the packaging of heavy materials such as cement, sugar and the like. Its patents are licensed to producers of such bags in all parts of the world. The company also established a division for the production of laminated plastics in its Panelits division. These laminated plastics are paperboards impregnated with synthetic phenolic resin, popularly known as Bakelite.

While St. Regis expanded from printing paper into other papermaking fields its vertical expansion included not only such items as the conversion and marketing of finished products, but also the basic field of forestry resources. Its purchase of the St. Paul & Tacoma Lumber Co. with St. Regis stock valued at $50,000,000 gave St. Regis a foothold in the Pacific Coast region for its expansion with a kraft and paperboard mill at Tacoma, Wash., at a cost of $30,000,000. All of these developments make St. Regis the third in rank among all United States paper companies.

The Mead Corporation

Mead Corp., like St. Regis, originally a printing paper producer, manufacturing high grade book paper, as compared with St. Regis' ground wood printing papers, has expanded startlingly in the paperboard field. This has been chiefly through exchanges of a million shares of its stock in payment for other companies, chiefly in the converting field. The growth of its paper board output has been such that in 1959 this and related fields represented 57 per cent of the company's output. The packaging division of the company and Mead Containers were formed as divisions of the parent concern to govern the paperboard converting field. In the broadening of paper manufacture, the company by the horizontal type of merger acquired the Chillicothe Paper Co. (book paper), Wrenn Paper Co. (Blotting), Hurlbut Paper Co. (Writing) and Wheelwright Division (Bristol Board), in addition to its own construction of kraft and paperboard mills. Close alliance with other companies for the protection of its raw material needs came through a multi-million dollar erection of the Brunswick, Ga., pulp mill jointly owned with Scott Paper Co., and a linerboard plant at Rome, Ga., jointly owned with Inland Container Corp. The scope of the company's operations can be appreciated when it is noted that it operates no less than seventeen container plants. Typical of its white paper production is the parent plant at Chillicothe, O., with eleven paper machines and now its products are going at retail to the ultimate consumer.

While these companies are outstanding in the number of subsidiary mills which have come to them through the merger route, many other paper companies have expanded on a less striking scale.

Weyerhaeuser

Weyerhaeuser Timber Co., whose importance in the lumber field is comparable to that of the original Rockefeller holdings in the oil industry, has branched from its original lumber operations into the paper field with pulp and kraft mills in Oregon and Washington. It has entered the paper container field by securing control of the important Kieckhefer and Eddy companies with mills in New Jersey and Michigan and converting plants in 15 states. It has entered the field of fine paper manufacturing by the acquisition of the Hamilton Paper Co. with eight fine paper machines in Pennsylvania and three in Michigan.

A. W. P. Co. — one of the first mergers

One of the first mergers in the paper industry was in the expansion fever days when Wall Street became involved in such operations as the formation of the United States Steel Corp. This was the formation of the American Writing Paper Co. in 1899, as one of the principal fine writing paper mills in the Holyoke, Mass., field, a region which still leads the world in its concentration of mills making the finest writing papers. Some thirty mills were in the original grouping, but some were later disposed of to centralize operations. The company still operates six mills in the Holyoke area alone.

Hammermill

Such companies as Hammermill have added to their facilities. This company, one of the first to produce fine paper exclusively from wood pulp, also operates the former Watervliet Paper Company in Michigan, the Beckett Paper Co. of Ohio, and companies in various states for the conversion of its paper into envelopes, as well as its latest advent into the paper distributing field.

West Virginia

West Virginia Pulp & Paper Co. purchased the important Hinde & Dauch Paper Co., a maker of shipping containers. The purchase of the United States Envelope Co., however, has been challenged by the Federal Trade Commission as a violation of the Sherman Anti-Trust Act.

Kimberly-Clark

Kimberly-Clark Corp., originally a book paper producing company, is the world's largest producer of cellulose wadding, sanitary materials and tissue papers. This phase of its operations developed from the German usage in World War I of absorbent hospital bandages of thin tissues combined in wadding form. The company broadened its operations into the writing paper field by purchases of the Munising and Gilbert Paper Cos., both in Wisconsin. By combining with the New York Times for the huge newsprint mill in Canada and with Southern newspapers for a newsprint mill in Alabama, the company became an outstanding newsprint paper manufacturer. Its merger with the P. J. Schweitzer Co. carried Kimberly-Clark into the field of cigarette and high priced light weight papers. In the converting field it added the American Envelope Co. of Ohio, valued at $15,000,000, as a subdivision. Its latest move takes it even farther in its approach to the eventual consumer. The company's latest move has been the purchase of a timber tract in California as the raw material source for a new mill to be built on the Pacific Coast.

Champion Paper

Champion Paper & Fibre Co., originally with plants in Ohio and North Carolina for fine and kraft paper manufacture extended its field into Texas with the building of a pulp and kraft mill. Champion was a pioneer in the development of processes to produce groundwood pulp for newsprint from southern pine, a problem originally complicated by the amount of rosin in this sepcies. In its expansion program, Champion has begun its entrance into the distributing field by purchasing mechandising companies in various parts of the United States. Among its activities have been the purchase of outstanding minority interests in such companies as Central Michigan Paper Co., Indiana Paper Co., Mid-West-Pak Corp., Montag Bros. of Atlanta (producer of school supplies) and Crown Plastic Co. of Fort Worth, Tex., all through the issuance of stock in the parent company. A million dollar deal gave Champion the Buffalo Envelope Co. Champion was the first of the manufacturers in 1961 to branch over into the major jobbing area.

International Paper

International, the giant of the industry, has not figured largely in merger developments except for its entry into the Pacific Coast region. As a means of broadening its coverage of the field, the company gave itself a plant for the production of fancy cover and similar papers by buying the A. M. Collins Paper Co. of Philadelphia. Entering the converting field, the company took control of the Lord Baltimore Press of Baltimore, Md., as a printing subsidiary. For the most part, however, International's expansion has been by the plowing back of profits into the addition of new machines.

This history of merger developments has been far from a complete listing, but merely gives the manner in which the industry has sought to gain greater efficiency in production and distribution by economic integration of existing units.

HAMMERMILL'S NEW FELTLESS WET MACHINE

Sandy Hill Kamyr feltless wet machine, cutter and layboy at Hammermill Paper.

THE RECENT addition of a Sandy Hill Kamyr feltless wet machine at Hammermill Paper Co. makes it possible to sheet and ship Neutracel (R) pulp to three other company-owned mills, i.e., Beckett Paper Co., Hamilton, Ohio; Watervliet Paper Co., Watervliet, Mich.; and the new Hammermill Division at Oswego, New York. The installation of this machine marks another important step in Hammermill's planned growth program.

The major portion of a $20,000,000 long term expansion program, started by Hammermill in 1956, was aimed at increasing the use of local hardwoods and expanding its pulp manufacturing capacity at Erie to provide support for new papermaking capacity.

In the spring of 1959 a continuous digester of completely new design was placed in operation for producing neutral sulfite pulp from hardwood by the Neutracel process.

In perfecting this process, Hammermill had found an answer in its search for a method of using the local and practically inexhaustible supply of mixed hardwoods available in the Erie area. The search had been prompted by the need to develop a new source of supply of pulpwood to compensate for the increasing scarcity of Canadian softwoods which had, for many years, provided the company's major raw material.

In addition to advantageous economic considerations, the Neutracel pulp possesses characteristics that are highly desirable in the production of fine paper. Neutracel pulp has an extraordinary whiteness, and it produces a particularly opaque and unusually level sheet.

With the new pulping process proved, and with full pulp mill capacity, Hammermill's management faced the problem of finding the most economical and efficient method of shipping the excess production to the company's subsidiary divisions.

Three men were entrusted with the responsibility of solving this problem. They were: Kurt Neuenfeldt, chief engineer; Karl E. Vogel, pulp mill superintendent; and Charles C. Hassell, project engineer. According to Mr. Hassell the three — working as a team — studied and observed all varieties of pulp-forming operations before deciding that Sandy Hill's Kamyr feltless wet machine was best suited for their needs.

Armed with a thorough knowledge of the behavior of hardwood pulps, Sandy Hill and Hammermill spent several weeks in joint study of applying the Kamyr wet machine to the forming of Neutracel pulp. The excellent start-up of the machine was proof that both time and effort were well spent. Except for a period required to establish maximum nip pressures and corresponding crowns for the press rolls and optimum stock temperature, the wet machine has operated from the very first in excess of specifications in both drying efficiency and tonnage output.

Field testing with stock at various temperatures proved that the special characteristics of the Neutracel pulp were more amenable to sheeting under high temperatures. Headbox temperatures are maintained in the range between 100° and 110° F. while the temperature of the shower water applied to the sheet on the mould just ahead of the first press roll is 180° F. The use of the hot water shower results in greater water removal and allows higher nip pressures on the press rolls without the danger of crushing the sheet.

Description of the wet machine and cutter layboy

The wet machine consists of a vacuum former, a first press, a set of pre-dryers and a second press.

The vacuum former has a 100-in. dia., "hard deck" stainless steel vacuum mould with a 126-in. working width. Two grooved press rolls operating under high nip pressures on the vacuum mould, assisted by watter doctors, remove water and densify the sheet enough to allow self-support between the mould and the first press. The internal drainage system of the mould promotes rapid water removal. The white water from the mould is recirculated to save steam and water, and to reduce fiber loss.

In the presses, a combination of grooved rolls, high pressures, proper introduction of the sheet into the press and adjustable water doctors encourage maximum water removal.

A lever provides for retracting the doctor blade during sheet threading. Air cylinders for pneumatic lifting and loading of the presses are enclosed within the framing. The press rolls are provided with totally enclosed gears.

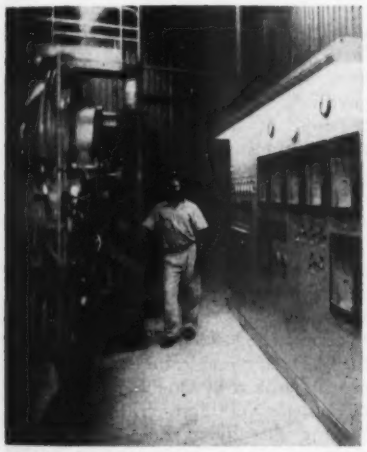
The pre-dryer section located between the presses further heats the sheet to permit greater nip pressure in the second press without the danger of crushing.

The sectional electric drive is governed from a control station on the tending side and with an automatic draw control mechanism between each section.

Pulp sheet coming off the mold.

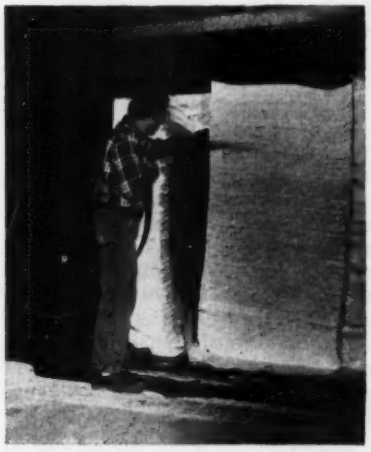
Predryers on the wet machine.

Second press on the wet machine.



Foxboro instruments control operations of wet machine.

K. E. Vogel, pulp mill supt., and C. C. Hassell, project engineer.



Inflatable dunnage bags stabilize pulp piles in loaded cars.

The pulp sheet leaving the second press, at an average bone-dry consistency of 55 per cent, enters a Hamblet Machine Co. automatic, heavy-duty pulp cutter with dual slitting arrangement. The cut sheets are delivered to a Hamblet automatic pulp layboy.

A unique elevator arrangement worked out between Hammermill, Hamblet Machine Co., and the Matthews Conveyor Co. of Elwood City, Pa., provides for the lowering of the full layboy to the floor beneath the machine room. Here the piles of pulp are automatically shifted, in rotation, to the weighing scale. At the scale the rollers of the conveyor drop away, leaving the pulp pile supported at three points ready for the forks of the lift truck to pick it up and transfer it to a box car. Neither pallets nor strapping of any kind are used on the pulp piles which are stacked tightly together, one pile high, in the box car.

When the final row of pulp piles has been placed in the box car a narrow space necessarily remains between the rows last stacked. To avoid any danger of shifting and resulting damages to the pulp piles, it was desirable to eliminate or fill this space.

The Goodyear Tire & Rubber Co. furnished inflatable dunnage bags to fit into the narrow gap. The deflated bag is slipped into the space as soon as the last pulp pile has been placed and is then inflated to a point where it will prevent any shifting of the pulp piles.

The entire operation of the department is handled by three men to a shift—the machine operator, one helper and the lift truck operator who works on the floor below the machine room.

CELGAR PULP MILL

Continued from page 360

A desilicizer pre-treatment plant is used to condition boiler makeup water. It comprises three cation units, three anion units. and necessary controls for automatic operation. Feedwater is heated in a 500,-000-lbs. per hr., spray-type deaerating heater designed to operate at 45-psi pressure. Three feedwater pumps — two 850-gpm, turbine-driven and one 500-gpm, motor-driven — supply water to the boilers equipped with three-element feedwater control system.

RHEOLOGY OF PAPER COATINGS

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Part VII – Behavior of coating mixtures on the coating machines *(Continued from August issue)*

Factors determining coating weight

A major factor in determining the amount of coat weight picked up in the size press coater is the solids content of the coating mixture (8). The maximum amount of coat weight which can be distributed evenly over the surface of the paper is determined by the machine speed, the composition of the paper, the type of size press in question, and the rheological characteristics of the coating mixture. While 45 per cent solids have been applied in numerous cases, 30 to 35 per cent solids appear more common in this application.

A coating mixture (9) using equal parts of a styrene and butadiene copolymer and oxidized starch at 40 per cent solids and with 35 per cent adhesive on the pigment had a Brookfield viscosity of 1610 centipoises (6 RPM at 150°F.) and showed some degree of thixotropy. This coating mixture worked well on the size press coater.

A high starch adhesive to pigment ratio is recommended in (10) size press coating. Such coating mixtures have solids ranging from 35 to 50 per cent. By using synthetic latices (11) as part of the binder the solids can be elevated above this range so that higher coat weights can be applied to make the size press an effective coater. The viscosities of size press coatings are relatively low as viscosities of coating mixtures are concerned. Good coatings have been made (12) with viscosities ranging from 100 to 800 centipoises.

The coating film put onto the surface of paper with the air knife conforms to the surface of the paper (13) because the stream of air used for metering the amount of coating applied is dimensionless, shearing off the excess coating mixture and leaving that left on the paper in the image of the surface. Under some conditions there exists the possibility of some of the coating mixture to be blown back against the lip opening to cause localized plugging. The amount of coating applied with the air knife depends upon the solids and viscosity of the coating mixture and the air pressure used for leveling.

The viscosity of the coating mixture for air knife coaters is low, good results having been obtained with mixtures at 100 centipoises. It is quite obvious that such coating mixtures must form very simple and loose structures, if any at all. The coating is so mobile that if the paper surface has raised fibers, the stream of air will blow coating against them (14) to produce a mottled effect.

The gravure coater will apply a uinform, light weight coating (13) on a relatively smooth surface. It is not surprising that it is used extensively to apply hot melt preparations onto smooth papers for protective purposes. It has been used effectively with pigmented coatings at solids contents up to 65 per cent (10). The coat weight is controlled by the pattern and depth of the gravure pattern. It is difficult to predict the flow properties of the coating mixtures for this type of coater because the different types and sizes of cells used require different flow characteristics. A serious problem has been the adjustment of the coating mixtures to change the coat weights without changing to other rolls of different gravure patterns. Light weight coatings applied by gravure will set very rapidly and there is no opportunity for leveling after the coating is applied. On heavier weight coatings, some leveling can be experienced if the coating mixture has a minimum of internal structure.

The trailing blade coater applies a high solids coating by a simultaneous metering and smoothing action at high speeds. The weight of the coating is varied by changing the viscosity and total solids of the coating mixture. One of the biggest difficulties of the trailing blade coating has been the streaking of the coated surface.

While it has been regarded generally that streaking is due to fuzz on the surface of the paper, hard substances in the coating mixture, too much moisture, and too little moisture, it has been reported that the selective absorption of the pigment binder (13) might have some influence. When this occurs, there will be a streak of coating on the surface of the paper which is rich in pigment and poor in adhesive. This view is borne out further by the observations that streaking was always accompanied by increases in the total solids content of the coating mixtures. If these observations are understood correctly, then it is highly desirable that more attention be paid to the base coating stock when streaks are troublesome.

The coating mixture in the trailing blade coater is subjected to extremely high shear (12). Since synthetic polymer emulsions have worked well as binders for pigments in such coating mixtures, it is nec-

essary that any emulsion or dispersion used must be stable to high shear. Coat weight is controlled not only by the solids content and viscosity of the coating mixture, but also by the flow properties (10). There is sufficient shear in the supply fountain to cause turbulence in any coating mixture that does not exhibit dilatancy. The thixotropic nature of the coating mixture has much to do with the amount of pressure it puts onto the blade. The solids content of the coating mixture is high enough and the speed of the coater great enough that one need not expect much change in the coated surface once it leaves the blade. It seems, therefore, that as much thixotropy as possible to still permit proper blade action would be of benefit. Furthermore, if the anisotropic nature of the base stock may play a role in streaking, then sufficient thixotropy to immobilize the coating very quickly after application should be an asset.

Brush and reverse roll smoothing coating mixtures may be considered together because of similarities in requirements. Since they are smoothed on the surface of the paper by very gentle physical action, low viscosity coating mixtures exhibiting Newtonian flow are used. There are instances in which slight dilatancy or slight thixotropy are used, but these effects must be very slight. Because of the shearing and cascading of the coating mixture in pumping it around, latices and dispersions must be shear stable (12).

In both cases, the coating is first applied to the surface of the paper in slight excess to that needed and then smoothed by either a brush or reverse roll. The smoothing mechanisms exert very little, if any, control over the coat weight (18) so that the coating mixtures must be watery thin.

The stationary blade coaters apply an excess of coating mixture onto the surface of the paper and then doctor off the excess coating with a rigid blade. It has been found that, if the stationary blade is replaced by a partially enclosed slowly revolving rod (13), streaking can be decreased considerably. In any event, a minimum amount of mechanical energy is applied at the point where the coating is smoothed which would indicate coating mixtures of low or no internal structures. Any fluid portion of the coating adjacent to the paper surface will be absorbed by the paper, leaving a semisolid filter cake on the surface of the paper (16). This layer can become dilatant very quickly under some conditions. If it occurs, then the doctor blade or rod will remove the excess fluid coating mixture from the highly concentrated layer next to the paper.

The curtain coater (15) is unique in that there is no mechanical contact between the coating machine and the paper. The coating mixture is forced through an orifice as a thin sheet of uniform and controlled thickness perpendicular to the direction of travel of the paper upon which it is deposited. One can see from this that coating mixtures that work well on this type of coater will not form internal structures. Since heavy coatings might require some leveling opportunity after being deposited upon the surface of the paper, even slight dilatancy might help.

Much has been written about the roll coaters which transfer coating mixtures from roll to roll and use various devices to smooth the coating mixtures on the applicator rolls. They can all use high solids, high viscosity, and highly thixotropic coating mixtures. These materials are all subjected to extremely high shear so that shearing stability is paramount. The fate of the coating mixture in the nip has been discussed above.

The behavior of coating mixtures on the various machines have been treated in a general way in which theory has been called upon time and again. It would be exceedingly difficult to be more specific since the condition of the machine, the base stock, the operating procedure, coat weight, etc. often make it necessary to alter the rheological nature of the coating mixtures to gain the desired result.

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HEAT EXCHANGERS

Continued from page 362

the equivalent of approximately 40,000 lbs of steam per hour. If the installation is operated for only 8 hours a day, 5 days a week, the savings in terms of average fuel costs alone amounts to over $34,000 a year.

Cost advantage of the plate exchanger is even greater in cases where the function for which the exchanger was originally designed changes and additional surface is required. Heat transfer surface can be increased in the plate unit by simply adding more plates. With the tube-and-shell exchangers more units are required. The upper limit for expansion of the standard plate heat exchangers now available is 1600 sq. ft. of heat transfer surface, corresponding to dimensions of 180 in. long, 33 in. wide and 73 in. high.

Plate heat exchanger in operation

At Finch, Pruyn & Co. the spent black liquor enters the exchanger at 162° F. and is cooled to 92° F. before discharge. In the transit it heats tap water for the sulfite washing station from 78° F. to 145° F. On continuous operation, substantial savings in fuel costs are provided.

This process cycle in which this heat exchanger is installed is essentially a complete circuit from water tap through exchanger where water is heated, to sulfite washing station where it mixes with hotter spent liquor from the digestor tanks, and then back through the exchanger for discharge.

Consolidated Water's heat exchanger is set up in two sections. The first plate section of the unit recovers approximately 6,120,000 BTU's per hour from spent sulfite liquor to maintain the water temperature in a log-soaking pond at 91° F. by continuous recirculation. This eliminates the expensive and

Continued on page 370

HEAT EXCHANGERS

Continued from page 369

inefficient method of blowing live steam into the pond.

A second plate section uses 180° F. spent liquor sulfite to preheat 45,000 lbs. of processed water per hour from 34° F. to 138° F., recovering approximately 4,680,000 BTU's per hour.

At the Bowaters Carolina operation the plate heat exchanger also serves a dual function. Since it is in the pulp digestor blow steam recovery system, the hot condensate is dirty. This condensate is circulated through the heat exchanger to heat clean water for use in the pulp mill. After the condensate has passed its heat to the process water through the heat exchanger, it becomes the cooling medium for the condensing operation. The system cools 1090 gpm of dirty condensate from 200° F. to 130° F. in the process of heating up 1630 gpm of clean water from 110° F. to 160° F.

Installation and cleaning

Two other distinct advantages offered by the plate-type heat exchanger are ease of installation and cleaning. No special preparation is needed for installation. The units are shipped ready for use except for piping connections. Most models have adjustable feet to permit immediate leveling. Since the unit is essentially vibration-free, it is not normally necessary to secure it with foundation bolts.

For most applications, the plate-type exchanger can be thoroughly cleaned while completely assembled by counter-flow circulation of caustic, nitric acid or other cleaning solution at high velocities — about 1½ times product flow. This in-place cleaning gets its effectiveness from the same factor that contributes to high heat transfer, the turbulent flow caused by the plate design.

In some applications the plate packs are opened each day to provide ready access to all surfaces for cleaning.

Plate heat exchangers do not, of course, solve all heat-transfer problems. They are limited to handling liquid of approximately 300° F. and cannot be used for pressures above 150 psi. However, for most pulp mill applications these are not serious limitations, as the examples cited here illustrated.

FIBER LENGTH INDEX FROM BREAKING LENGTH AND SLOWNESS

D. S. DAVIS
University of Alabama

FOR bleached sulfate pulp, fiber length index can be estimated from breaking length and slowness by means of the equation (1).

$$M = 3400\,L + 1970 \log (S - 18.5) + 3280$$

where

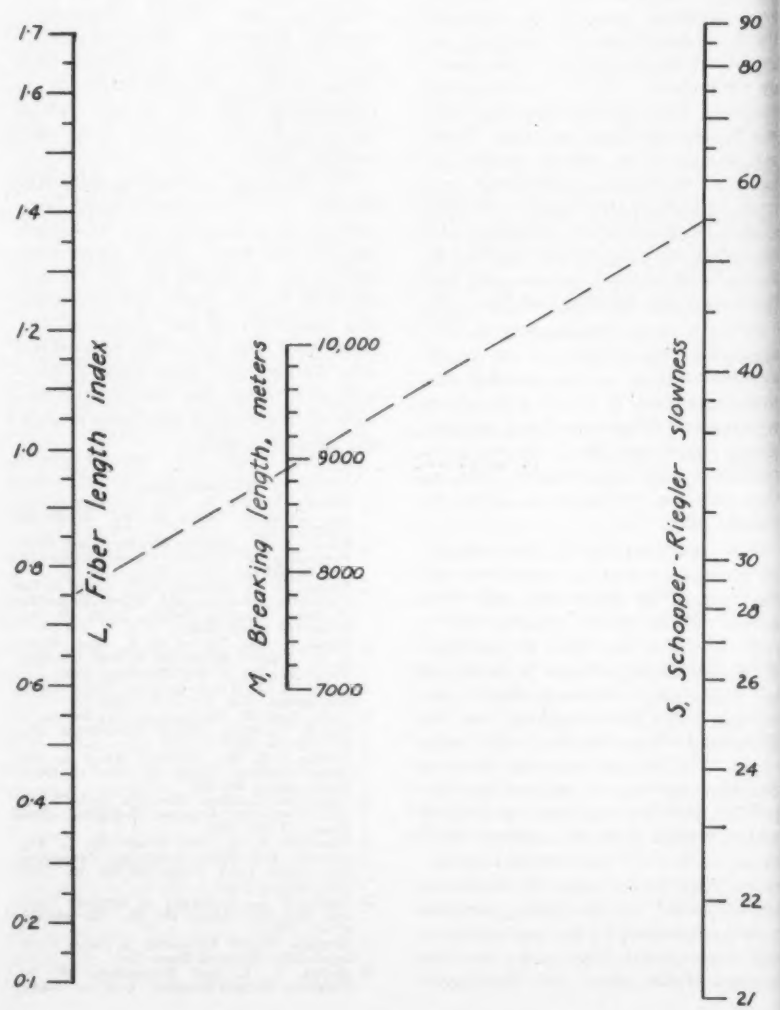
M = breaking length, meters

L = fiber length index

and

S = Schopper-Riegler slowness.

The accompanying nomograph, constructed in accordance with methods (2) described previously, enables one to solve this equation conveniently and accurately. The broken index line on the chart shows that a fiber length index of 0.75 is consistent with a breaking length of 8900 meters and a Schopper-Riegler slowness of 55.



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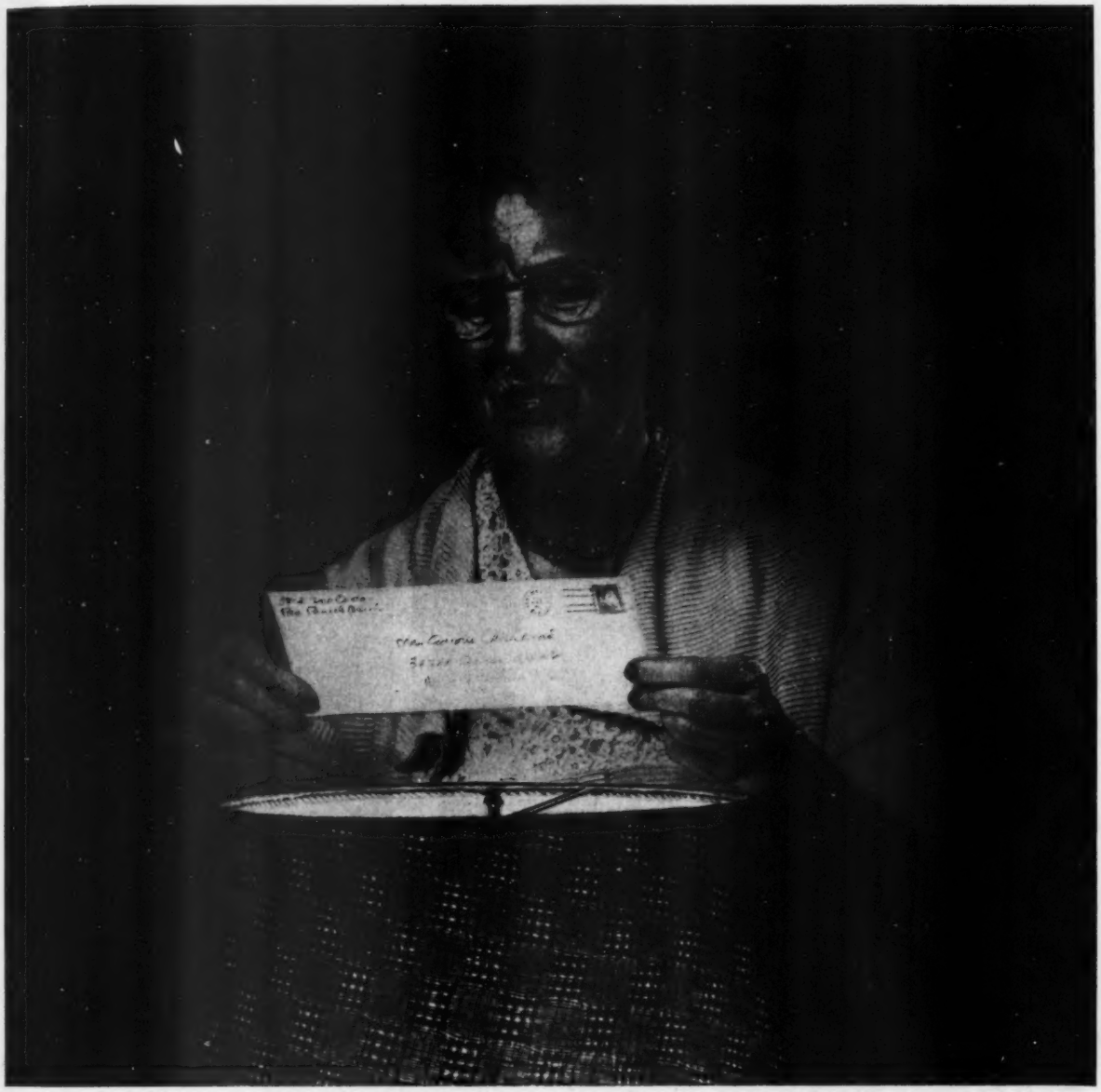

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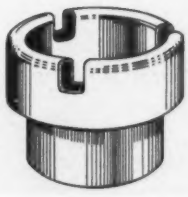

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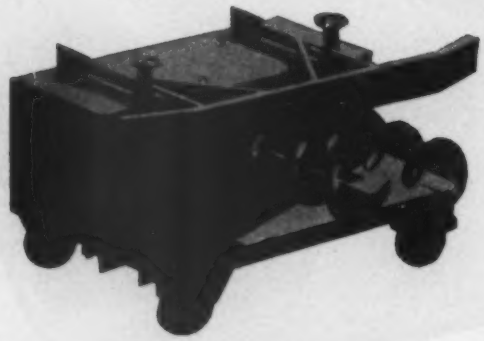

This discharger travels back and forth on rails in a tunnel under your chip pile. The action of its two counter-rotating screws withdraws the chips through a continuous opening in the side of the tunnel onto a traveling belt conveyor. A rapid and regulated flow of chips is fed directly to your digesters. No operator is required since the discharger is remote controlled from the digester floor. Feed capacities up to 100 cords per hour with 15 connected horsepower.

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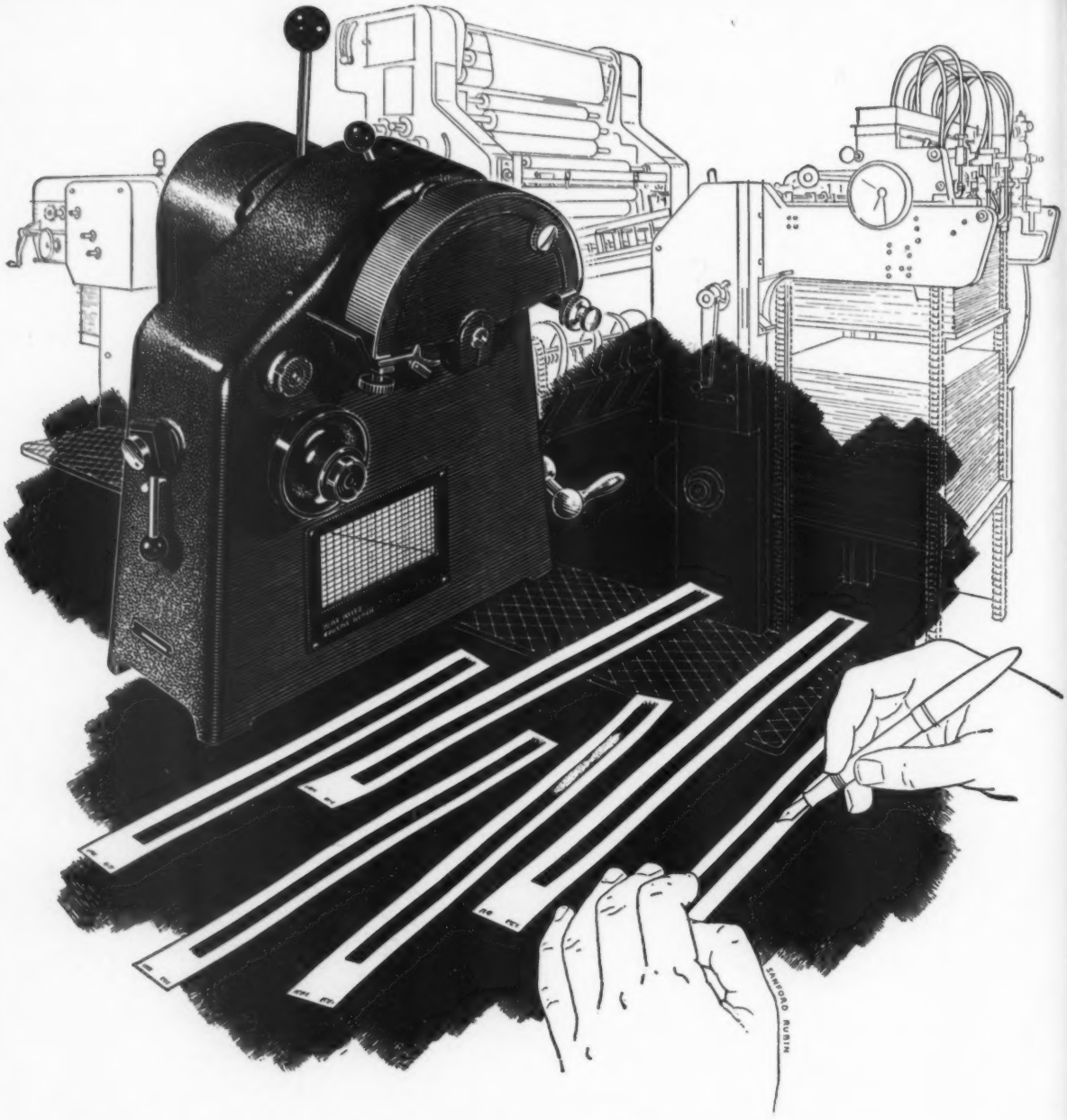

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Warren B. Bullock

Research — a standard practice • Britain's economic program • Analysis of earnings reports

The spread in research

Any development in the paper industry resulting from research by a single unit, almost immediately becomes standard practice throughout the industry. It is only a few months since Kimberly-Clark Corp. and the J. H. Stevens Co., specialists in the textile field, joined forces to produce and market a fibroid sheet, neither paper nor fabric, but a combination of the two, especially designed for throw-away and short-time-use purposes.

Now it is reported that the Mead Corp. is conferring with another company experienced in the textile field, M. Lowenstein & Sons Inc., investigating the possibilities of mutual opportunities in the textile field.

Even before the Kimberly-Clark-Stevens cooperative agency was formed, C. H. Dexter & Sons of Windsor Locks, Conn., announced its successful experiments in producing a new product on its paper machines. Thus one of the oldest paper companies in the United States was among the first to make radical innovations in what might be called the fibroid field.

This spread of research discoveries from the original laboratory to the industry at large is not new. Some typical instances of recent years might include the adaptation of the Troy cotton shirt manufacturers invention to prevent shrinkage to the reverse operation of producing paper that stretches, a sheet that is now produced by several companies under royalties from the original proponents. The development of "wet strength" paper by the infusion of melamine is another which has become industry-wide. Cigarette paper that breathes, through its porosity, is merely one of a host of developments, originated by a single company or laboratory, and then expanded throughout the industry.

The success of the Certain-Teed Products Co.'s alliance with a financing corporation for the national sale of what are called paperboard shell houses has resulted in sharp increases in the company's profit picture. As a result, original Certain-Teed stockholders have been allotted rights to buy a total of 127,632 shares at a price of $34 per share. The Wall Street open market quotation for the stock was $46 per share on July 19, the date when the offering became effective.

England raises import duties

The British Government's "tighten-your-belt" economic program may have an adverse effect on American shipments of paper and paperboard into the United Kingdom. While the American administration is conferring with GATT in an effort to secure reciprocal reductions of duty rates, England is raising its import duties 10 per cent. What effect this will have on Britain's increasing interest in modern packaging, much of the material coming from the United States paper and paperboard plants, is problematical, but it can hardly fail to check what was developing as an attractive market for American mills.

In other portions of Europe, however, American interests continue to plan expansions. Diamond National is arranging to make packaging materials in Italy and Weyerhaeuser is preparing to produce corrugated paper containers in Belgium.

Mid-year earnings

An analysis of mid-year earnings reports of the principal paper companies indicates a slight upward trend. This can be judged from a somewhat higher income in the second quarter, as compared with the March period; though in nearly every case, profits are below those of the comparative half-year of 1960.

Symptomatic of this better outlook comes the announcement from a group of corrugated paper containers that prices are being raised effective in most cases on September 1. The move comes originally from Crown Zellerbach Corp. which announced an increase for its customers east of the Rocky Mountains from 10 to 14 per cent. Other companies indicated that they would go along with the raise, including among others: International Paper Co., St. Regis Paper Co., Union Bag-Camp Corp., Packaging Corp., Inland Container Corp., and Container Corp., usually about 10 per cent above going prices. Continental Can Corp., announced an increase of $9.50 per ton on corrugating mediums. This upward price move follows only a few weeks after International announced a cut in its price for certain kraft grades. In the printing paper field, however, Kimberly-Clark Corp. has announced a reduction in the price of some of its printing papers grades ranging from $3 to $10 per ton. This Kimberly-Clark move came at the same time that a group of New York investment houses announced an issue of $30 million, 25-year debentures at an interest rate of 4⅝ per cent.

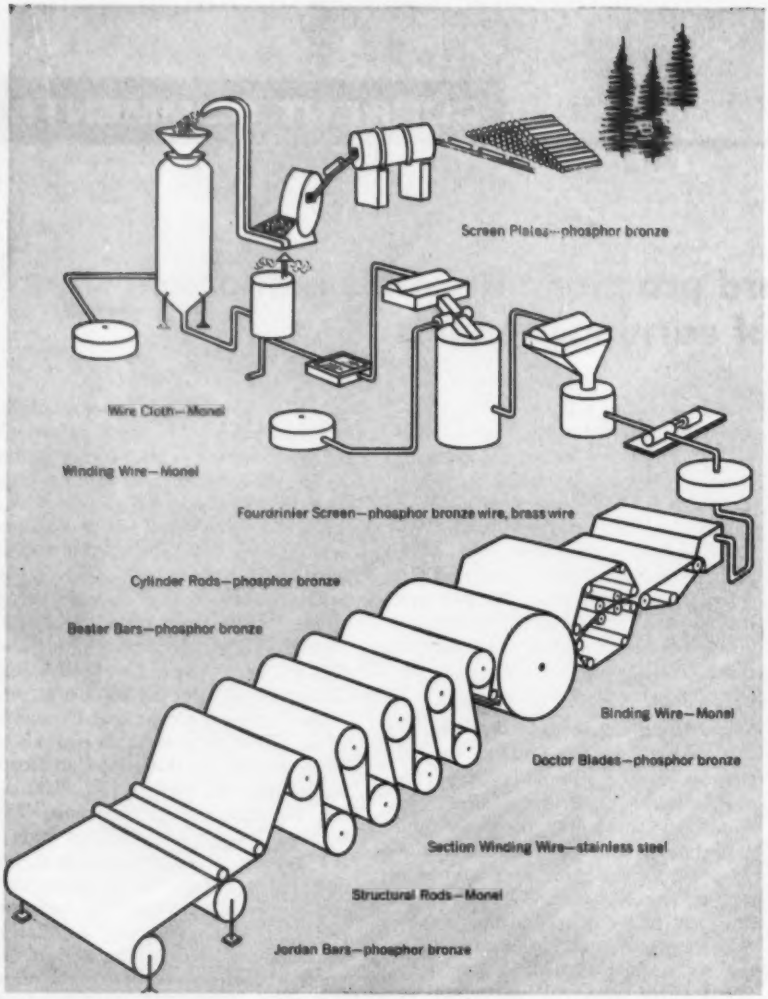
I.P. — a billionaire company

International Paper Co. is named, incidentally, in a recent issue of "The Exchange" — the official magazine of the New York Stock Exchange. "I.P." is listed as No. 52 in a tabulation of 52 billionaire companies in American industry, these companies being those with sales of one billion dollars or more a year. General Motors, with sales of $12,736,000,000 is the top member of this Billionaires Club. International is also named in this publication as one of the 30 corporations whose figures are used to compute the Dow-Jones Industrial Average.

Net incomes

Union Bag-Camp Corp. — Income for June quarter, $4,320,216, and for

Continued on page 378



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CURRENT COMMENTS

Continued from page **377**

the half year, $8,252,181; a year ago, $5,234,947 and $10,218,000, respectively.

Great Northern Paper Co. — Income for 24 weeks ended June 18, $1,330,508; a year ago, $1,222,231.

Riegel Paper Co. — June quarter, $945,835, and for the half year, $1,577,638; a year ago, $912,582 and $1,749,974 respectively.

St. Croix Paper Co. — Half year, $467,000; a year ago, $702,000.

Sealright-Oswego Paper Corp. — Six months, $1,046,160; a year ago, $819,048.

Container Corp. — Net income for half year dropped to $8,846,000; a year ago, $9,984,000. Sales were only slightly below those of the first half of 1960, and sales for the June quarter rose slightly.

Rayonier Inc. — Half year, $3,733,482; a year ago, $5,860,020. Second quarter net, however, was $2,176,677 as against $3,215,407 a year earlier.

St. Regis Paper Co. — Half year earnings, $8,567,200; a year ago, $12,350,597.

Crown Zellerbach Corp. — For June quarter, $9,882,000 and for the half year, $18,210,000; a year ago, $11,179,000 and $20,295,000, respectively.

Albermarle Paper Mfg. Co. — For June quarter, $394,092; a year ago, $668,096.

Certain-Teed Products Corp. — June quarter net income, $1,689,671 and for the half year, $2,001,426; a year ago, $731,843 and $799,229, respectively.

Allied Paper Corp. — Half year, $835,870; a year ago, $222,875.

Hammermill Paper Co. — For 24 weeks ended June 18, $1,088,228; a year ago, $1,882,841.

Scott Paper Co. — Both June quarter and the half year broke all records in all categories. Net income for June quarter, $7,272,855 and for the half year, $13,959,319; a year ago, $6,275,075 and $13,401,935 respectively; Sales totaled $83,618,395 and for the half year $163,037,358; a year ago, $77,650,700 and $157,863,947 respectively.

Mead Corp. — Twelve weeks ended June 31, $3,156,171; a year ago, 3,783,004. While earnings dropped for the first half of the year as compared with a year ago, sales volume increased.

Federal Paper Board Co. — Half year, $1,414,000; a year ago, $1,782,000.

Inland Container Corp. — Six months, $2,502,000; a year ago, $3,046,000.

Standard Packaging Corp. — Twenty-four ended June 18, $1,312,944; a year ago, $2,977,132.

Continued on page **380**

Tile Tank Hi-Lo Pulper at Byron Weston Company

SOLVES LOW HEADROOM PROBLEM

Hi-Lo Pulper tile tank installation at Byron Weston Company, Dalton, Massachusetts.

The low speed rotor, with large curved blades, provides quick breaking and maximum circulation, forcing stock across the tank to the high speed rotor for defibering.

The notched blades of the high speed rotor, turning at an average tip speed of 7600′ per minute, project only ¼" and use power most efficiently for defibering. The blades, held securely by duroid wedges, can be easily replaced.

In January of 1960 Byron Weston came to Jones with a special pulping problem. To produce their high grade cotton fibre papers Byron Weston uses a wide variety of hard-to-defibre furnish. They needed a pulper that could handle this furnish efficiently, but . . . here was the problem . . . they also needed a pulper which could be installed in 10′ headroom and still handle 35 tons per day.

Jones engineers solved both problems effectively with a specially designed tile tank Hi-Lo Pulper. It meets the limited headroom requirements without sacrificing the proven efficiency of the standard height stainless steel tank Hi-Lo.

Designed for batch or continuous pulping with low power consumption, the Jones Hi-Lo Pulper can be installed in areas where the headroom is as low as 6½′.

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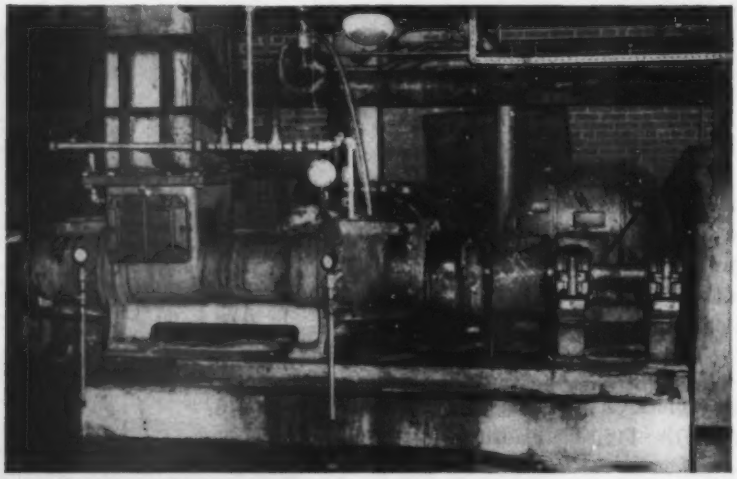
to move all types of high density stock cleanly, efficiently, most economically

Capacities to 750 tons per day; pressures to 300 PSIG; densities to at least 18%; no need for auxiliary feeding; no pulsation. These are a few of the production features of the Warren High Density Screw Pump that promise greater pumping economy...with any type of stock, in any locality.

In the South, one of the well-known installations that is producing to full planned capacity is at Union Bag-Camp Paper Corp., Savannah, Ga.



Warren No. 11 High Density Pump; up to 455 GPM; 12-15% washed hardwood pulp from washers to storage.

Ask for information, including a detailed listing, on how other mills throughout the country are using the versatile Warren High Density Screw Pump. And remember that Warren engineering is always ready to help with the most economical solution to your special pumping problems.

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CURRENT COMMENTS

Continued from page 378

International Paper Co. — Second Quarter, $15,810,565 excluding capital gains from sale of securties; a year ago, $18,610,501. Sales were slightly higher than a year ago. For the half year income, $36,540,735, excluding capital gains; a year ago, $37,096,202.

Financial note

Following the general upturn and record-breaking high figures for Wall Street securities, paper mill issues were almost without exception higher in mid-August than a month earlier. There was less interest, however, in preferred issues than in the more speculative common stocks.

Stock and Bond Quotations

New York Stock Exchange

Closing Prices	August 10, 1961	July 10, 1961
American Can	44⅜	42¼
Same Pref	38	37⅝
Celotex	26⅝	29
Same Pref	*19¼-19½	*19-19⅝
Certain-Teed	58¾	54⅜
Champion Paper	32¾	31¼
Same Pref	92¾	*92¼-93¾
Chesapeake of Va.	36½	*36-36⅝
Container	25⅛	23¼
Same Pref	*92½-95	*93½-94
Continental Can	46¼	40½
Same Pref	*81½-82¼	*84-85¼
Crown Zellerbach	57¼	54
Same Pref	*91¼-92¾	*94-95
Diamond National	42	41
Same Pref	31⅛	31½
Federal Paperboard	39	36
Same Pref	*22¾-23¾	*23⅛-23¼
Fibre Paper Board	30¾	29⅞
Great Northern	58¾	56
Hammermill	31½	31
International	35	30¾
Same Pref	*94½-95½	*94⅛-95½
Kimberly-Clark	82¾	80
KVP Sutherland	36½	34½
McAndrews & Forbes	34⅝	35
Masonite	29⅞	31
Mead Corp.	43⅜	39½
Same Pref	*90⅛-93½	*91-91¼
Minn & Ont	32¾	32⅝
Nat Vulc Fib	21½	24¼
Oxford Paper	30⅛	31¼
Same Pref	*93-95	*96-98
Rayonier	22	20¼
Riegel Paper	31⅝	31½
St. Regis	37½	34½
Same Pref	*97-99	*98-99
Scott Paper	112⅝	109
Same $4 Pref	*91-92¼	94
Same $3.40 Pref	*75-76¾	*77½-79
Sealright	41⅝	39¾
Standard Pack	23¼	23
Same $1.60 Pref	*66½-73	70
Same $1.20 Pref	29¼	28
Same 6% Pref	*27-27⅜	29½
Union Bag-Camp	37¼	36⅛
United Bd & Cart	*21-21¾	*21¾-22¾
U.S. Gypsum	101¾	103½
Same Pref	*153½-155½	*154-155
West Va P & P	37	34¾
Same Pref	*94-96	*96½-97

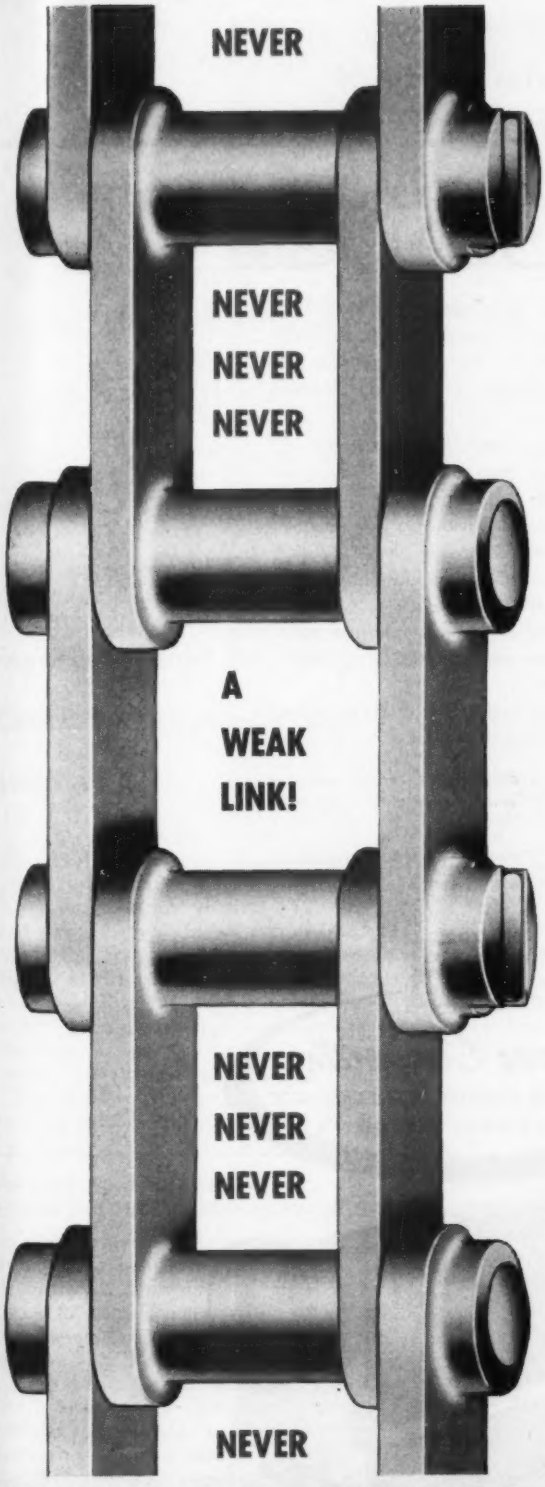
New York Stock Exchange — Bonds

Champion Paper 4½%	112¼	109
Champion Paper 3¾%	88	94⅛
Diamond Gardner 4%	—	—
Kimberly-Clark 3¾%	90	—
Oxford 4¾%	109⅜	110
Scott 3%	144	140

American Stock Exchange — Stocks

Allied Paper	16⅛	14¼
American Writing	33	33
Brown Co.	13¾	13
Puget Sound	22⅞	22¼

*Closing Bid and Asked Prices



TISCO®

PULP WOOD CONVEYOR CHAIN

Despite heavy impact, excessive dirt and severe strain, Tisco Pulp Wood Conveyor Chain *works* steadily — profitably — without let-up — for these reasons:

1. Whether you use impact resistant TISCO Manganese Steel chain, with its capacity to work harden to high hardness, or TISCO heat treated alloy steel chain for maximum resistance to abrasive wear, you can count on quality, accuracy and service.
2. All TISCO chain is proof tested at 50% over the recommended working load.
3. Chain pins are of high strength alloy steel or, wherever corrosion is a factor, stainless steel, heat treated to a suitable hardness, can be furnished.

TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION

Established 1742

HIGH BRIDGE 5, NEW JERSEY

PLANTS: Cincinnati, O. — Birmingham, Ala. — Easton, Pa.

SALES OFFICES: New York — Chicago — Milwaukee — San Francisco

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Matched STEEL ROLL EMBOSSER

This new development from Paper Converting is available as a *separate installation or an attachment to re-winders, folders or printing presses,* and features —

- Matched steel rolls for long life and low maintenance — no "run-in" time required.
- Air loading with adjustable precision nip control
- Fully enclosed oil lubricated herringbone gears
- Tapered inner race spherical roller bearings arranged for hydraulic removal
- Automatic cleaning and lubricating for embossing rolls.

WANT TO KNOW MORE? Please write or call and we'll send you complete information and specifications.

FOLDERS, REWINDERS, EMBOSSERS, NAPKIN AND CORE MACHINES, LETTERPRESS AND FLEXOGRAPHIC PRESSES, SPECIAL CONVERTING MACHINERY.

P C M C

Paper Converting
MACHINE COMPANY
GREEN BAY, WISCONSIN

Model ME-60

creative engineering and development of converting machines *since 1919*

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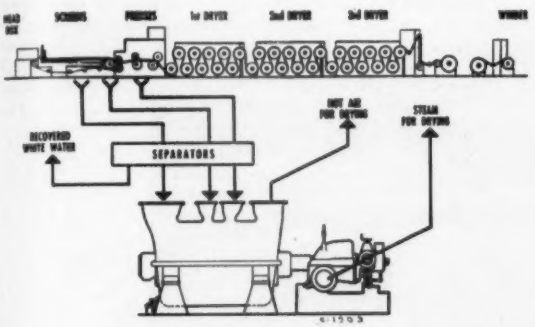

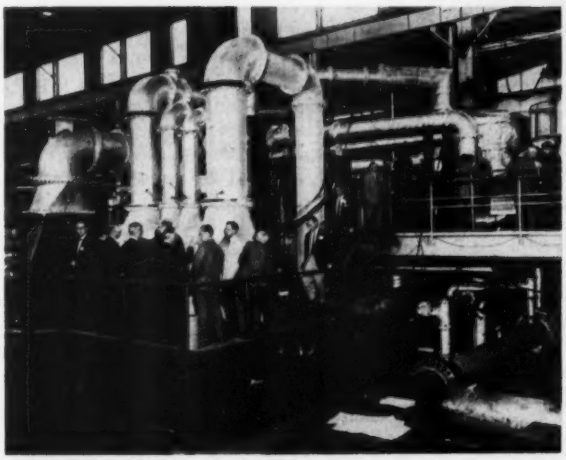

Ingersoll-Rand Demonstrates New Central Vacuum System To Industry Leaders

Ingersoll-Rand's new central vacuum system was recently unveiled for inspection to over 150 members of the paper-making industry. An elaborate test installation was set up at Ingersoll's Phillipsburgh, N.J., manufacturing and test facilities. The test installation was highly instrumented so that the industry executives could see for themselves exactly how the automatic control system maintains requisite vacuums at all points. The system was put through a series of running tests which also included a simulated paper break.

The new central vacuum system, said to be the first of its kind in the United States, is designed to handle all the vacuum requirements for an entire paper machine. A central centrifugal exhauster with multiple inlets provides vacuum at various levels, and the exhauster can be driven by either electric motor or steam turbine. According to J. A. Wiendl, vice president and domestic sales manager for Ingersoll-Rand, the system will cut annual operating costs by more than $25,000.

This system does the work of six or more individual vacuum pumps and is said to reduce vacuum horsepower requirements for a paper machine by 25 per cent. The heat recovery is equivalent to from 70 to 90 per cent of the driver horsepower and can be used for heating and drying applications throughout the mill.

At present, Ingersoll-Rand has orders for such systems. The first one is expected to be installed and in operation before the year's end.

Forestry Research Study In Hardwood Timber Management

An agreement to jointly conduct research in the management of hardwood timber for the production of pulpwood has been signed by the Mead Corp. of Dayton, Ohio, and the U.S. Forests Service.

In this agreement, L. R. Growdon, Mead vice president, has pledged that his firm will supply the land, share in the financial support and to otherwise cooperate in the project. The Central States Forest Experiment Station has agreed to assign the scientific personnel and provide the technical facilities necessary to carry on the research project.

The research program will be conducted on the 700-acre Mead Experimental Forest which is located in southwestern Ohio. The project will be headed by Ivan H. Sander, a professional forester. Answers will be sought to such questions as: (1) How and when do you harvest pulpwood trees so as to assure good forest stand for the future? (2) What steps can be taken to increase the growth rate of pulpwood as well as sawtimber trees? (3) What is the optimum age for harvesting a pulpwood tree?

Institute Authorizes Two Research Projects

The Pioneering Research Program of the Institute of Paper Chemistry has authorized funds for the following two scientific projects:

Mechanics of Degradation and Nature of Relationships Among High Molecular Constituents of Wood and Wood Fibers. Dr. Ellis B. Cowling, an assistant professor of Forest Pathology in the School of Forestry at Yale University, has received funds for this three-year study.

An Exploratory Investigation of Antibiotics and Growth-Stimulating Agents in the Bryophyta. Dr. B. W. Coursen and Dr. R. H. Trumbore of Lawrence College, have received funds to finance this two-year study.

Six projects are now being financed by the Pioneering Research Program which has support of $125,000 a year from 24 companies and foundations, and is administered through The Institute of Paper Chemistry.

recent expansions

Rome Kraft Operates Plastic Filter System

Koroseal rigid vinyl plastic has been used in the construction of a new trickling filter system which is now in operation at Rome Kraft Co. of Rome, Ga. This is the first vinyl-cored plant in operation and was designed specifically for pulp and paper waste.

The new 100,000-cu.-ft. plant is three stories high and contains about 370,000 lbs of rigid Koroseal vinyl preformed into 6,250 filtercomb-like units or "packs" which are manufactured by B. F. Goodrich Industrial Products Co. Filtercomb units are made by joining alternate sheets of corrugated Koroseal rigid vinyl to flat sheets to form a "pack" that is approximately 4 ft. long and 2 ft. wide and deep.

At Rome Kraft, the filter unit is octagonal in shape with walls constructed of concrete block and contains ten layers of the Koroseal units. The packs are arranged at right angles to each other to give maximum structural strength. The surface area provided by the filtercomb design — 40 sq. ft. of surface for every cubic foot — provides a large area for bacterial growth and with its open construction, insures more rapid oxidation than is possible with the rock-type filter. The vinyl material actually occupies only four per cent of the volume of the plant, leaving the remaining 96 per cent free for air circulation, waste distribution and bacterial growth.

The Koroseal vinyl used in the system has proven to be superior to other plastics and structural strength, ease of fabrication and resistance to chemicals. The filtercomb units perform the same function as broken rock or tile in conventional stone trickling filter beds. P. W. Perdriau, president of the Goodrich Industrial Products Co., stated that because of the unique design, the filtercomb is tremendously more efficient. He also stated that the structural strength of the vinyl and the design of the filtercomb make it possible to stack the units one on top of the other, to heights of 30 or 40 ft. or more. This means that considerably less land area is required for plants of this type.

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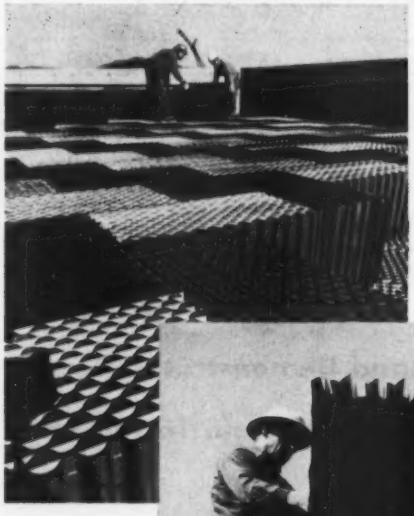

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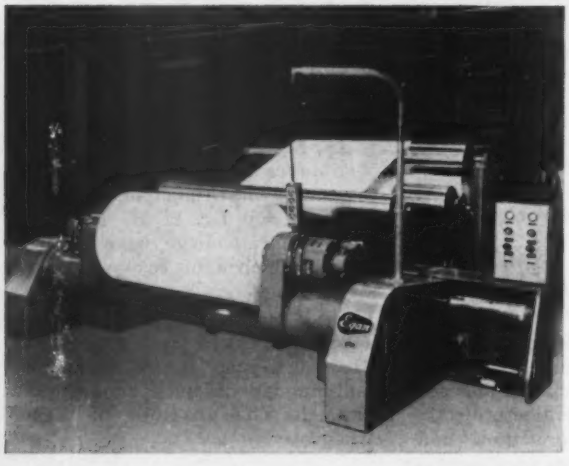
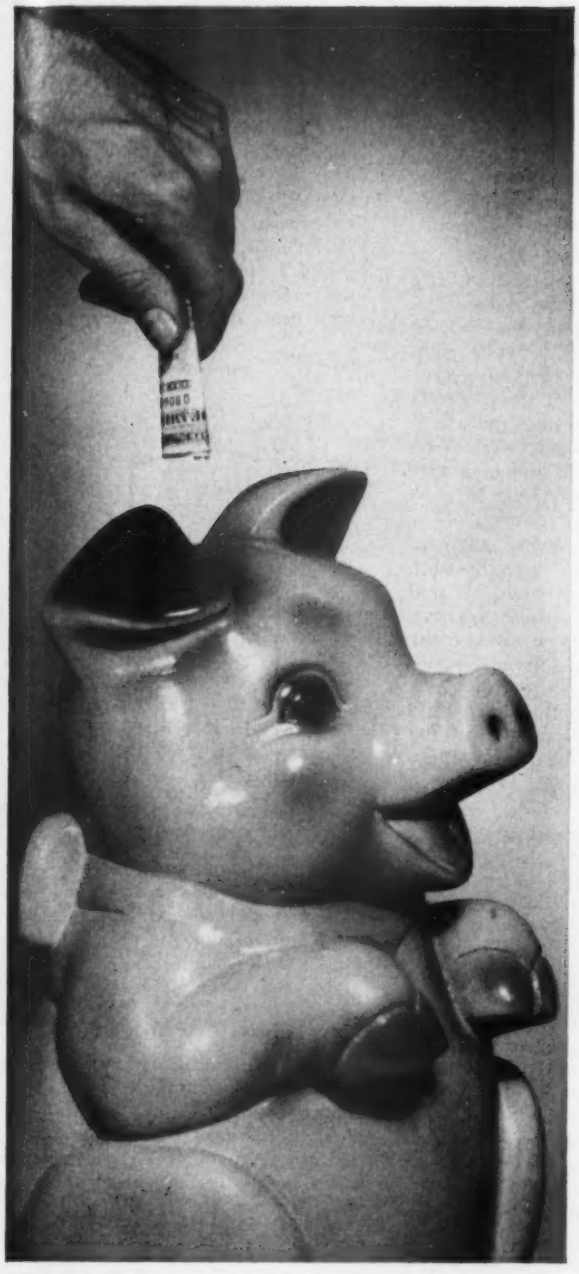


S. D. WARREN INSTALLS NEW TYPE SHAFTLESS UNWIND

The first of Frank W. Egan & Co.'s newly introduced shaftless unwind stands has been recently installed in S. D. Warren Co.'s Cumberland Mills, Me., plant. The unit, operating at speeds up to 1,000 fpm, will handle rolls 84 in. wide with diameters up to 50 in. Other models are capable of handling rolls from 12 in. to 90 in. with diameters ranging from 14 in. to 60 in. They operate at speeds up to 3,500 fpm.

Continued on page 386

Photo by Harold M. Lambert



*Idea submitted by Charles Dufon,
Packaging Corp. of America, Filer City, Michigan

HAM FELTZ says:

"Reminds me of HAMILTON Felts . . . they save money every day!"

"The day you start using Hamilton Felts
you start saving money.
Hamilton Felts reduce the high cost
of down-time because they are
engineered for longer machine life
and trouble-free performance.
They are 'water-conditioned'
for faster water removal,
deliver drier sheets to the driers,
keep your machines running at top speed
with fewer stops and less broke . . .
When new felts *are* required
Hamilton Felts provide further savings
because they are pre-shrunk . . .
broken-in to fit *your* machine.
That means less down-time for changeovers.
One of our 'standard 300' technically proven styles
should solve *your* problem.
If it won't, we will be happy
to design a Hamilton Felt that will.
Just ask your Hamilton Felts Service Salesman
how we can help you
turn out more tonnage with less broke.
Or write us today!"

*WIN . . . *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each idea from a U.S. papermaker that we use wins a new 1961 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. Every U.S. papermaker *entrant* receives a famous Rex Spoon fishing lure — FREE. Send me your suggestion — today.
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Cincinnati 2, Ohio."

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This new catalog of brushes for industry offers a wealth of valuable brush engineering information. It will show you how METLKOR Brush Tools can solve many problems better, faster, cheaper and more efficiently. It is designed in convenient file folder form, and multiple copies are available for cross-filing purposes. The catalog features the three basic brush functions of applying, removing and arranging, and illustrates the various types of machine driven brushes that fall into these three categories. Helpful information is provided on the choice of bristle for particular jobs, and a multitude of bristle arrangements is shown. Short case histories are included and illustrated that show how Jenkins' METLKOR Brushes have solved many difficult problems. Send for your copy or copies today!

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NEWS OF THE INDUSTRY

Continued from page 384

Buckeye Adapts Interface Detection Method In High-Density Bleach Towers

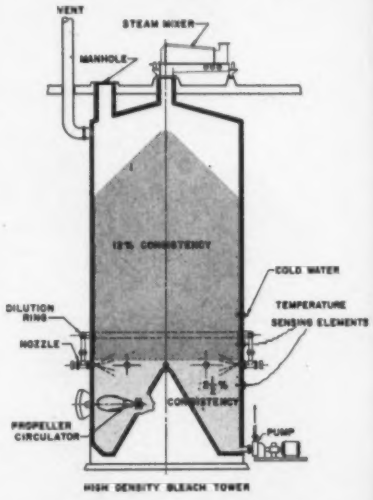
Buckeye Cellulose Corp. of Memphis, Tenn., has successfully adapted a temperature differential method of detecting the interface in high-density stages of wood pulp bleaching. This new method is presently in operation on three bleach stages in Buckeye's wood pulp mill at Foley, Fla. It has proven to be inexpensive to install and maintain, and extremely satisfactory in performance.

During the high-density stages of modern continuous wood pulp bleaching, bleaching chemicals and steam are added to pulp in a mixer, from which the pulp drops into the top of a retention tower. Consistencies of 10 to 15 per cent are generally maintained at this point. Pulp is removed from the bottom of the tower by injecting water to dilute it to about 3 per cent, agitating it and then pumping it out.

When this equipment is properly designed and operating correctly, there is a sharp division, or interface, between the dilute pulp in the bottom and the high-density pulp above. The movement of this interface must be kept within a narrow range in order to maintain adequate retention, insure uniform operation and prevent plugging of the discharge pipe. Detection of the position of the interface is therefore of extreme importance.

The standard temperature differential method had been used at Foley wood pulp mill since the beginning of operations. A new detection method had to be found, however, when a second mill and a parallel bleaching system were installed as part of a plant expansion program. To achieve best operating conditions in the new system and provide the most economical use of steam, hot water from waste heat was made available for washing after passing through several hot, high-density towers. As a result, the temperature of the dilution, or mining, water approached that of the pulp in the tower, thus preventing satisfactory use of the standard interface detection method.

After trials of several alternate systems, it was found that the temperature differential method could be made to work by injecting a small stream of cool water just above the top thermometer. Ten to 15 gpm of cool water was found to cool a small portion of high-density, downward-flowing pulp — registering a cooler temperature on the upper thermometer — while the lower one remained hot from the well-agitated, low-consistency slurry below the interface. As the interface drops, the cooling reaches the lower thermometer; and as it rises, the dilution water heats the upper thermometer.



Buckeye engineers believe the method would be practical for interface detection in cool, high-density pulp storage systems also, with injection of hot rather than cool water above the thermometers.

New Laboratory For Huber

J. M. Huber Corp.'s Chemicals Division will complete a new research laboratory and administration building at Havre de Grace, Md., in September. The new structures will augment plant facilities devoted to the manufacture of chemicals and synthetic pigments for the paint, paper and rubber industries. Total area of all structures will be 32,000 sq. ft.

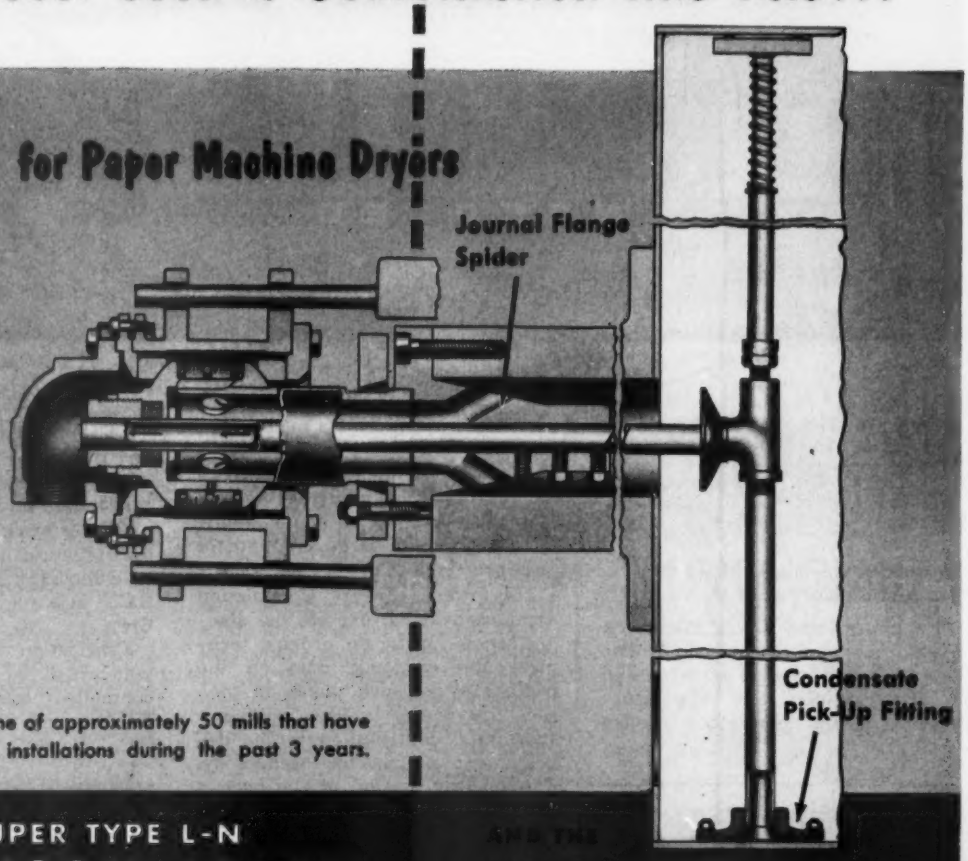
Albany Felt Appoints Paper Mill Suppliers

Albany Felt Co., Albany, N.Y., has announced the appointment of Paper Mill Suppliers Inc. of Kalamazoo, Mich., as the exclusive agency for the distribution of "Dri-Tuft" and "Dri-Weave" dryer felts manufactured by the company. Paper Mill Suppliers is headed by Frank Clawson, formerly regional manager for Brandon Sales Inc.

Continued on page 388

You've never seen a Combination like this*...

for Paper Machine Dryers



* Unless yours is one of approximately 50 mills that have made tests and installations during the past 3 years.

SUPER TYPE L-N

JOHNSON JOINT
with "Quick Release" Nipple

AND THE

NEW JOHNSON ROTARY SYPHON

Best Design Yet for getting steam into dryer rolls with rotating syphon pipes. Needs no lubrication or adjustment. Has only a few simple parts—less chance of trouble plus easier field servicing. Assembly plate provides ready access to syphon pipe.

Floating Action—Rod supports carry all the real weight, let the rotating assembly "float" freely inside. Adaptable for machines with open or enclosed gearing.

SUPER Construction...*and Stamina*—Teams rock hard "Green Streak" seal rings with special Ni-Chrome plating, slashes friction load and increases service life.

Easy on...and off—"Quick Release" nipple uses powerful wedging action to lock joint in place. Install it—or remove it—with just an end wrench.

Engineers' Data Book summarizes research behind this new development, has full technical information. Ask for copy of: "Condensate Behavior in Paper Machines."

Better Drainage of dryer rolls results from a new concept of condensate pick-up design. Holds condensate to a minimum. Rotary Syphon can be located any place along the dryer shell. Helps to reduce horsepower requirements.

Higher Roll Temperatures—Thinner condensate film means better transfer of heat units to dryer shell. Better drying can be translated directly into increased production.

Easier Installation—No need to get inside dryer to drill and tap dryer head. Install right through manhole. For rolls with handholes only there's even a journal-inserted rotary syphon.

Reduced Maintenance—Only a few simple trouble-free parts. Ends bearing wear caused by unnecessary water weight and prolonged "cascading." Easily removed for inspection.

Trial offer still goes. We'll gladly furnish a pair of Joints and Syphons for 90-day trial in your own mill, without cost or obligation. Ask for details.

THE JOHNSON CORPORATION

845 Wood Street, Three Rivers, Michigan

Rotary Pressure Joints • Direct Operated Solenoid Valves

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NEWS OF THE INDUSTRY

Continued from page 386

Atomic Power To Be Used In Production Of Paper

Fitchburg Paper Co. of Fitchburg, Mass., has applied to the Atomic Energy Commission to participate in a demonstration low-temperature process steam generating project which will incorporate a nuclear reactor. A low-temperature process heat reactor is the type designed to fit the needs of industrial operations such as those in paper manufacturing, where large amounts of heat are required.

The Atomic Energy Commission announced that it expects the demonstration reactor to provide technical and economic data on the practicality of such plants in high fuel cost areas, besides making a substantial contribution to the development of reactor technology. The nuclear portion of the project would be financed principally by the AEC.

Fitchburg uses enormous amounts of steam for drying its paper during production, as well as for providing electric power to operate all plant machinery. The new project would include an indirect cycle nuclear steam supply system designed to meet the saturated steam requirements of the plant. Fitchburg will be expected to provide the site and facilities for the use of the steam, operate the entire plant at least five years as part of its process steam installation, and purchase the steam produced by the reactor.

The nuclear reactor would supersede the power plant that Fitchburg now has and which is fueled by oil. However, the existence of the fuel oil power plant, would meet an AEC requirement — that the participating company have a standby source of power to replace the reactor in the event of breakdown.

According to plans, the reactor project should be ready for operation in about three and a half years. The design would be based upon existing technology, and have an output capacity of from 30,000 to 40,000 thermal kilowatts at steam pressures ranging from 15 to 200 psi.

Fabrication Of A Log Flume At Bowaters

Ten thousand headed concrete anchors were stud-welded recently in a single work-week by one man during fabrication of U-shaped steel lines for a log flume at the Catawba, S.C., mill of Bowaters Carolina Corp.

Fabrication of the flume lining, which will be 1000 ft. long when completed, was performed by the Kline Iron & Steel Co. of Columbia, S.C.

A total of 105 headed concrete anchor studs, measuring ⅝ in. dia. and 5⅛ in. long, was welded to each 20-ft.-long flume section with two 400-ampere motor generators in parallel serving as the power source. The plates were formed into half U's and the rounded ends were then bolted together and hand welded to steel ribs embedded in the concrete trench.

The liner sections were designed and studs specified by the Bowaters Engineering & Development Corp. of Calhoun, Tenn. The studs were supplied by Nelson Stud Welding, a

DOUBLE

the length of filter runs

Over 30 years of use in a variety of industrial and other installations have shown that Anthrafilt will give filter runs approximately twice as long as sand or quartz. Rates up to 200 mgad are obtainable with less clogging and packing than similar media.

Plus these other advantages:

Requires only half as much wash water.

Keeps filters in service longer periods.

Increases filter output.

Gives better support to synthetic resins.

Better removal of fibrous materials, micro-organic matter, etc.

Ideal for industrial acid and alkaline solutions.

Effective filtration from entire bed.

Less coating, caking or balling with mud, lime, iron or manganese.

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For more data circle 126 on Post Card

division of Gregory Industries Inc. of Lorain, Ohio. The general contractor was the Daniel Construction Co. of Greenville, S.C.

Marathon Builds Pilot Plant

The Marathon Division of American Can Co. is constructing a pilot plant that will enable the Division to consolidate long-range, developmental manufacturing activities.

The new construction will house laboratories and small-scale machinery that is employed to develop new products and production processes, as well as to improve existing manufacturing methods. Equipment will include woodpulp digesters, a paper machine, coaters, plastic extruders and printing presses.

Location of the new pilot plant will be in the southwest section of Neenah at a point between Marathon's general office buiding and its Neenah plant.

Penick & Ford Opens New Territory

The creation of an autonomous Pacific sales territory for the Corn Refining Division of Penick & Ford has been announced. This Pacific area had formerly been a district of the Western territory. Harold A. Harvey has been appointed as sales manager.

Fiberboard Plant in Greece

A credit of $2.5 million has been authorized by the Export-Import Bank of Washington to Xelotex Industries S.A., a private firm of Salonika, Greece. This loan will be used to finance the purchase of U.S. equipment to outfit a fiberboard plant to be built near Salonika.

The plant is being designed to produce a daily capacity of 100 tons using local sources of raw materials, which are said to be adequate.

New Company Formed

Dorcon Inc., a wholly-owned subsidiary of Dorr-Oliver Inc., Stamford, Conn., is being formed to engage in the design, manufacture, fabrication and field erection of metal tanks, water and chemical storage facilities, and process and reaction vessels.

Officers of the new company will be: Alex Fino, president; K. Earl Abel, treasurer; and John W. Swick, secretary. Administrative and engineering offices will be at Warren, Penn., and sales headquarters in Pittsburgh, Penn., with Max G. Walker as sales manager.

Continental Can Will Soon Move to New Headquarters

Continental Can Co. has announced it will consolidate its head office staff and all of its other New York City offices in a new building at 633 Third Ave. in late August and early September of this year. Certain of the company's division offices from outside of New York will also relocate in the 15 floors of the new 41-story building. The organization's telephone number will be 551-7000.

Albany Felt Expands

A million dollar plant improvement program which will enable Albany Felt Co. to expand production and provide new and larger styles of customized paper machine felts, will be done at the cost of $680,000 at the St. Stephen, S.C., plant, and $350,000 at the Albany, N.Y., plant.

At the Albany plant the expansion will include the acquisition of new needling equipment which will allow the Needling division to service a wider range of paper machines. In addition, two large looms, one measuring 550 in. and the other 670 in., will be delivered to Albany.

At South Carolina, construction of a 33,000-sq.-ft. one-story addition is underway. The space will provide for future expansion in weaving, yarn making and needling.

Nichols Opens Spray Dryer Laboratory

Nichols Eng. & Research Corp., of New York City and San Francisco, has announced the establishment of a spray dryer laboratory at a new office location — 1336 N. Carolan Ave., Burlingame, Calif. Complementing the laboratories at Netcong, N.J., the new facilities, under the continued direction of Frank J. Murray, Jr., will permit basic spray drying research to be performed on the West Coast.

Packaging Corp. To Expand At Filer City

A million-dollar addition to the facilities of Packaging Corp. of America's bleached kraft mill in Filer City, Mich., has been announced by the company.

Improvements include an 81,500-sq.-ft. building, now under construction, which will expand the bleached kraft finishing room and provide additional warehouse space, a heat recover system and additional finishing equipment.

Continued on page 390

LITTLE GIANT ROLL CLAMPS

Increase warehouse capacity!

Handling larger rolls and utilizing every cubic foot of available stacking space greatly increases profits.

Rolls of tissue, kraft, newsprint or coated paper; rolls of textiles, rugs or plastics; concrete pipe, etc., can be picked up, rotated, transported indoors or outdoors or stacked by a lift truck equipped with a **Little Giant** Rotating **Roll Clamp.**

Roll is held firmly — but gently. Clamp design prevents crushing or gouging of roll by equalizing pressure over entire area of large pads. Jolting will not cause roll to slip and tear the wrapper. Roll is gripped tightly until released.

Any lift truck equipped with a **Little Giant** Rotating **Roll Clamp** handles **more** rolls and **larger** rolls — faster and cheaper.

Write us for Brochure #9124 describing all models and sizes.

Available from all lift truck manufacturers and their dealers throughout the world.

LITTLE GIANT LIFT TRUCK ATTACHMENTS

LITTLE GIANT PRODUCTS, INC.

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Tile Linings
Membrane Linings
Tile Structures

Design, Construction and Maintenance

STEBBINS ENGINEERING AND MANUFACTURING CO.
WATERTOWN, N. Y.
Pensacola, Seattle, Montreal, Vancouver

Circle 128 on Post Card

NEWS OF THE INDUSTRY

Continued from page 389

Second Extensible Unit in Operation at St. Regis

St. Regis Paper Co. has begun operation of a second extensible unit which has been installed on its new 262-in. Beloit paper machine at Tacoma, Wash. St. Regis now produces extensible paper on both the East and West coasts.

This installation, the 16th in operation, will be followed by a number of additional units now being built for Clupak Inc. licensees.

Antara Opens Houston Office

Raymond F. Welter has been appointed to the new position of district manager of a newly created Southwestern District Office for Antara Chemicals, a Division of General Aniline & Film Corp. The company's new office will be located at 3939 Essex Lane, Houston 6, Texas, and will cover Mississippi, Louisiana, Oklahoma and Texas.

Products sold through the new office will include acetylene derivatives, surfactants, organic chemicals and specialty products.

Jamesbury Forms New Company

Jamesbury Corp. of Worcester, Mass., has announced that the company along with Serck Ltd., the Birmingham engineering group, have formed Jamesbury-Serck Ltd. in Gloucester, England. The new company will manufacture and market the Jamesbury "Double-Seal" ball valve and related products. The new company will also import certain Jamesbury valves from the original plant in the U.S.A.

Hercules Powder Appoints Distributor

Moreland Chemical Co. of Spartanburg, S.C., has been appointed a distributor of synthetic resins by the Pine & Paper Chemicals Dept. of Hercules Powder Co. of Wilmington, Del. Moreland, who also handles Hercules' pine chemicals, will be distributors of synthetic resins for protective coatings, adhesives and other applications.

Continued on page 392

HANCHETT SLITTER KNIFE GRINDER (Wet Grind)

SK-24

for CIRCULAR
Top or Bottom SLITTER KNIVES
(of all types)
Full Automatic or Semi-Automatic
Reasonably Priced

This Machine GUARANTEES:

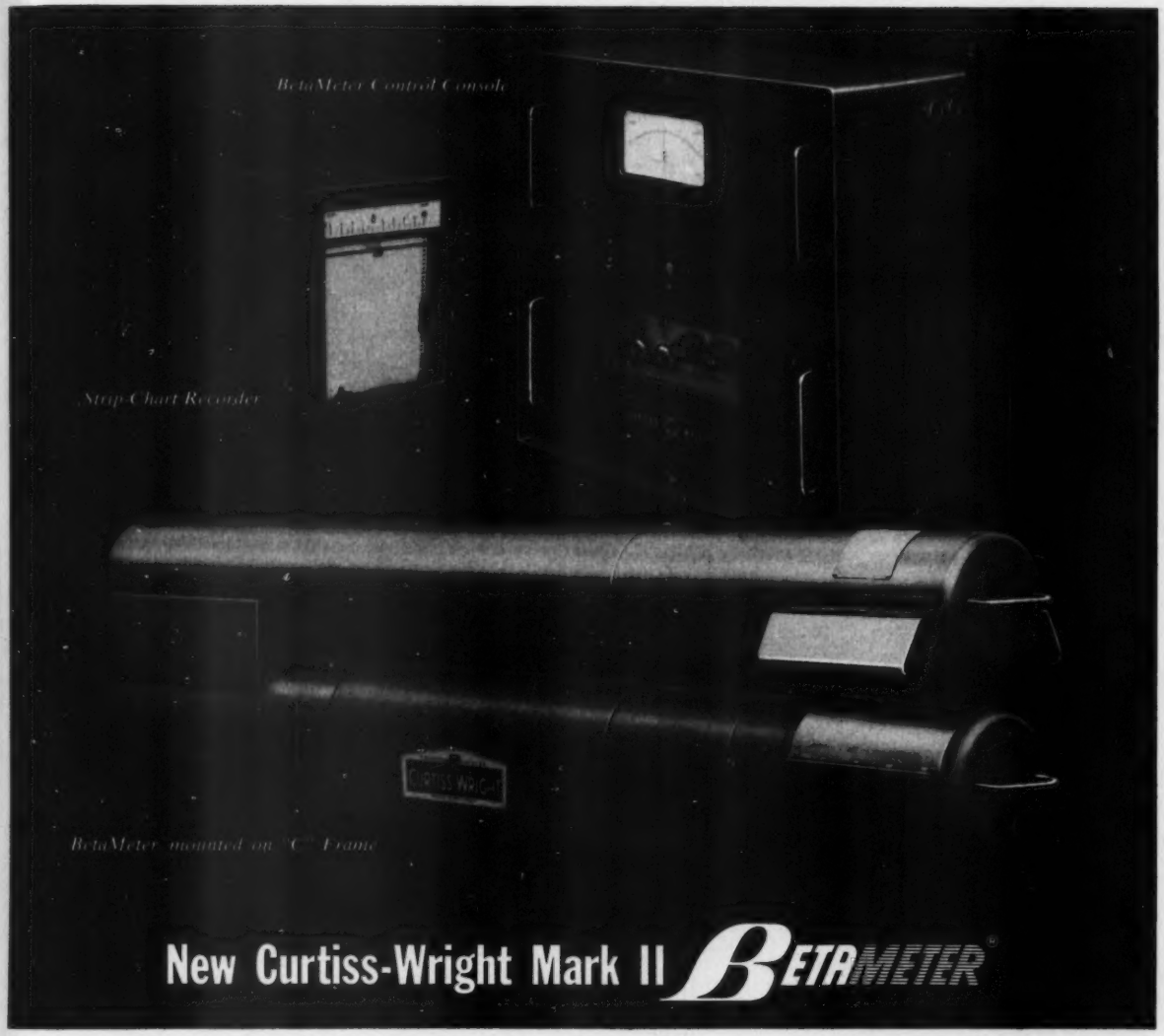
CONCENTRICITY (running truth) to .0005
SHARP — CLEAN CUTTING KNIFE EDGES
LONGER MILL LIFE (less changes)
POSITIVE — ACCURATE FIXTURING
FINEST MICRO INCH FINISHES
CAPACITY — 2½" to 24" DIAMETER

Let us prove the value of this machine:
Send us your knives for test grinding.
There's no obligation.

HANCHETT MANUFACTURING COMPANY
World's Largest Manufacturer of Knife Grinding and Saw Sharpening Machinery
MAIN OFFICE — Big Rapids, Michigan WEST COAST — Portland 1, Oregon

HANCHETT GRINDERS

For more data circle 129 on Post Card



Measures Basis Weight and Thickness . . . Only $4985.

BetaMeter in operation measuring 0.00025" film thickness

The Curtiss-Wright Mark II BetaMeter takes the guesswork out of basis weight or thickness measurements in the production of coated stock, paper, plastic or similar sheet products, making it unnecessary to apply "more than enough" to be sure of meeting specifications. In the manufacture of extruded products, close tolerances are maintained to ensure correct length yield per pound.

This economical BetaMeter utilizes radioactive isotopes to measure actual production quality without contacting the material or affecting the process in any way. Weight or thickness variations across the sheet are detected instantly, enabling the operator to make immediate corrective adjustments. The Result: Faster start-ups and grade changes, reduced scrap losses and more uniform quality products.

The $4985 price includes control console, recorder, and BetaMeter on "C" frame for handling up to 36" webs. Other frames for larger webs are available at reasonable cost. Automatic process control equipment is manufactured for the BetaMeter and all other standard Curtiss-Wright measuring systems.

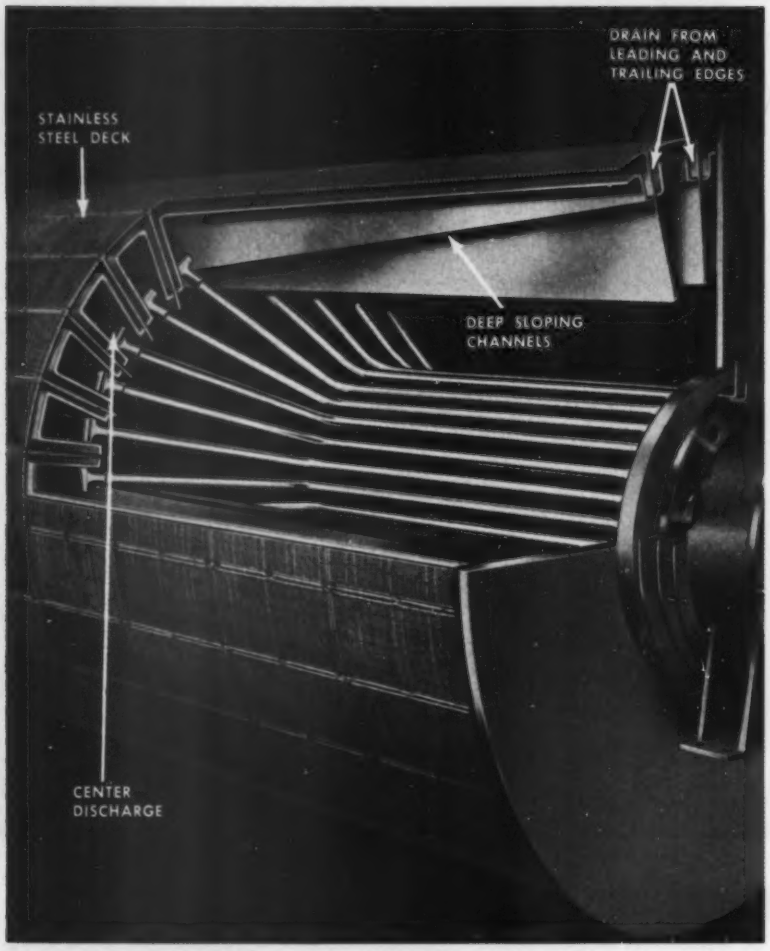
Increase your profits through better quality control with the economically-priced Curtiss-Wright BetaMeter - phone SWinburne 9-0500 or write.

Princeton Division CURTISS WRIGHT CORPORATION Princeton, New Jersey

IN CANADA: Canadian Curtiss-Wright Ltd., Industrial Process Controls, Davis Road, Oakville, Ontario.

For more data circle 130 on Post Card

HERE'S WHY SWENSON PULP WASHERS OPERATE WITH LESS DILUTION



Extensive operating records of Swenson Pulp Washers show consistently lower dilution required to produce exceptionally clean pulp. The reason is the superior hydraulic system inside the drum, assuring maximum effective use of drum surface through the Swenson arrangement of deep, sloping drain channels and center discharge piping.

Less dilution, in turn, means lower evaporator costs. Money-saving advantages like these, coupled with traditionally long, trouble-free service life, are characteristic of Swenson equipment.

Your Swenson engineer has extensive experience in pulp washing operations. Why not contact him today.

***FREE:* Technical article, *Measuring Brown Stock Washer Effectiveness.* Presents simplified method, backed by operating data from a variety of operations. Write for your copy to: Swenson Evaporator Company, 15653 Lathrop Ave., Harvey, Illinois. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ont., Can.**

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WHITING — MANUFACTURERS OF CRANES; TRAMBEAM® HANDLING SYSTEMS; PRESSUREGRIP®; TRACKMOBILES®, FOUNDRY, AND RAILROAD EQUIPMENT.

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Coming Events

TAPPI

September 19-21 — 4th International Mechanical Pulping Conference, Edgewater Beach Hotel, Chicago, Ill.
October 4-6 — 6th Deinking Conference, Harris Hotel, Kalamazoo, Mich.
October 9-11 — 16th Plastics-Paper Conference, French Lick-Sheraton, French Lick, Ind.
October 15-19 — 16th Engineering Conference, Shoreham Hotel, Washington, D.C.
November 1-3 — 15th Alkaline Pulping Conference, Rice Hotel, Houston, Texas.
February 18-22, 1962 — 47th Annual Meeting, Hotel Commodore, New York, N.Y.

PIMA

September 20-22 — Fall Meeting, Northwestern Division, Faust Hotel, Rockford, Ill.
September 21-24 — Northeastern Division, Poland Spring House, Poland, Me.
October 5-7 — Connecticut Valley Division (joint meeting with TAPPI), Equinox House, Manchester, Vt.
October 11-13 — Southeastern & Southern Divisions (annual fall joint meeting), Jung Hotel, New Orleans, La.
October 12-14 — Pennsylvania-New Jersey-Delaware Division Fall Meeting, Claridge Hotel, Atlantic City, N.J.
October 19-21 — Miami Valley Division Annual Meeting, French Lick-Sheraton, French Lick, Ind.
October 20 — Annual Fall Meeting of the Michigan Division, Dearborn Inn, Detroit, Mich.
November 30-December 1 — Pacific Coast Division Fall Meeting, Olympic Hotel, Seattle, Wash.
January 11, 1962 — Connecticut Valley Division, Publick House, Sturbridge, Mass.
January 18, 1962 — Michigan Division (Annual Papermakers Get-Together), Hotel Harris, Kalamazoo, Mich.

OTHER MEETINGS

September 18-20 — Tenth Annual Meeting of the Standards Engineer Society, Hotel Sherman, Chicago, Ill.
September 21-22 — Forest Land Use Conference, Shoreham Hotel, Washington, D.C.
September 24-27 — American Institute of Chemical Engineers, Lake Placid Club, Lake Placid, N.Y.
September 27-30 — 3rd Virginia Biennial State-Wide Industrial Exposition, Roanoke, Va.
October 5-8 — Paper Stock Institute Fall Meeting, Arlington Hotel, Hot Springs, Ark.
October 8-12 — Water Pollution Control Federation, 34th Annual Meeting, Hotel Schroeder, Milwaukee, Wis.
October 15-19 — 17th Annual International Instrument-Automation Conference & Exhibit of the Instrument Society of America, New York Coliseum, New York, N.Y.
October 16-20 — 49th Meeting of the National Safety Congress, Conrad Hilton Hotel, Chicago, Ill.
October 18-20 — 23rd Annual National Packaging Forum, Biltmore Hotel, New York, N.Y.
October 22-25 — N.P.T.A. Fall Convention, Conrad Hilton Hotel, Chicago, Ill.

PHOTOGRAPHY BY GEORGE NORDHAUSEN

Checkmate forest fires

Fires ravage about five million acres woodland and range annually in the United States. Prevention is everybody's job!

Weyerhaeuser Company

Pulp and Paperboard Division

A good line to remember

Mark this down with your lines of truth: "Coated stock with a uniform finish makes sales go up." CLINTON starches and dextrins make sure your coating is consistently smooth and free from "skips." When gloss printing quality and strength count most, use CLINEO starches. And, to improve all-around printability and control curl, specify CLINCAL starches (they contain their own lubricants). With these starches, you can select from many varieties. Customers and prospects who judge paper on its face value can see and feel the difference when you use CLINTON coating starches.

Technical service always available

CLINTON CORN PROCESSING COMPANY

CLINTON, IOWA

For more data circle 133 on Post Card

Crown Zellerbach Corp.

William H. Maxwell, product manager for bags and bag papers at the company's San Francisco headquarters, has been named an assistant resident manager of the Antioch, Calif., paper mill division.

Arthur W. Wetmore replaces Maxwell at headquarters as product manager for bags and bag papers. Wetmore has been serving as superintendent of the multiwall bag department at Antioch.

Bertram L. Steinberg replaces Wetmore at Antioch as superintendent of the multiwall bag department. Steinberg was multiwall shift foreman at Antioch.

Brown Co.

Donald H. Welch, of Birmingham, Ala., will become manager of operations of Brown's new Bermico Fiber pipe and conduit plant in Birmingham. Welch, who was superintendent of the Birmingham plant, relieves Robert W. Andres who supervised construction and startup of the new plant.

Robert A. Larson, formerly development manager for Allied Paper Co., Kalamazoo, Mich., has joined this company as technical assistant to the vice president and general manager of the Paper Division. In this capacity, he will be responsible for grade development, process and quality control, and technical service.

Southwest Forest Industries

M. F. "Mike" Doyle, of Baie Comeau, P.Q., Canada, has joined Southwest as groundwood superintendent for the Snowflake Mills, Arizona. He will supervise the production of groundwood pulp for the manufacturing of newsprint.

T. M. Lindley, until recently, project engineer for Potlatch Forest Industries, Lewiston, Idaho, will be kraft pulp mill superintendent at Snowflake. Lindley will supervise the production of pulp needed in the manufacture of kraft paper and linerboard.

Ralph A. Lawrence joins the company as personnel director.

Samuel M. Langston Co.

Kenneth W. Knorr has been named sales engineer, southeastern region, by this company of Camden, N.J. Knorr will make his headquarters in Atlanta, Ga., to serve the corrugated container and paper industries in N. Carolina, S. Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, portions of Texas and Tennessee, Mexico, Puerto Rico and the West Indies.

Knorr

Krogel

Rhinelander Paper Co.

Elton T. Krogel was promoted from acting pulp mill superintendent to pulp mill superintendent of this division of St. Regis Paper Co. in Rhinelander, Wis. Krogel is a member of PIMA and an associate member of TAPPI.

British Columbia Forest Products Ltd.

T. N. Beaupre has been elected president and a director of British Columbia Forest Products Ltd. Beaupre replaces C. D. Dickey, Jr., who has been on loan from Scott Paper Co. where he is returning to continue his previous association in an executive capacity, although he will remain a director of British Columbia.

West Virginia Pulp & Paper Co.

John Dittrich has been appointed regional administration manager for the Hinde & Dauch Division, Sandusky, Ohio. Dittrich will be responsible for all matters pertaining to administration and personnel for plants in Richmond, Baltimore, and Gastonia, N.C. He will also serve as staff cost coordinator for Richmond regional management.

Ostberg

Kurz

Link-Belt Co.

A. W. "Webb" Ostberg has been appointed manager of warehouse distribution for Link-Belt Co., Chicago, Ill. Ostberg will coordinate the operations of 17 company zone warehouses.

Harry F. Kurz has been appointed distributor representative of this company for the central U.S., from the Mississippi to the Rockies.

Western Michigan University

Russell H. Savage of Chillicothe, O., will become the new head of the department of paper technology at Western Michigan University in Kalamazoo.

Rayonier Inc.

Lowell M. McGinnis has been appointed to the position of resident manager of Rayonier's Grays Harbor Division. He will succeed George A. Holt who is retiring.

Joseph A. Krauth, who has been resident engineer, will replace McGinnis as assistant resident manager at Grays Harbor. In turn, Krauth's post will be assumed by Lester R. Reekers, former assistant resident engineer.

Consolidated Water Power & Paper Co.

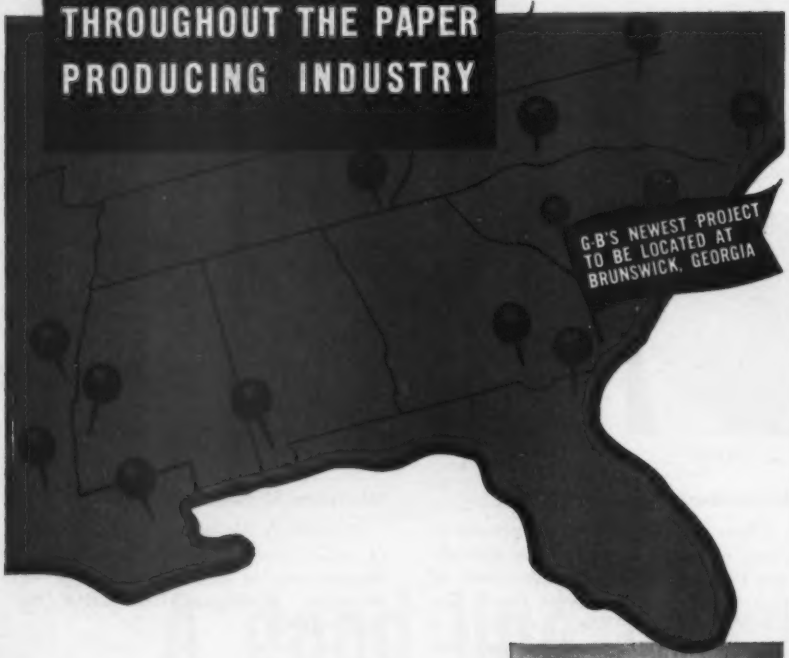
William J. Haselow has been appointed quality control supervisor at the Wisconsin Rapids Division of the company. He formerly served as quality control engineer in the department.

William Aschenbrenner, quality audit supervisor since 1958, has

Continued on page 396

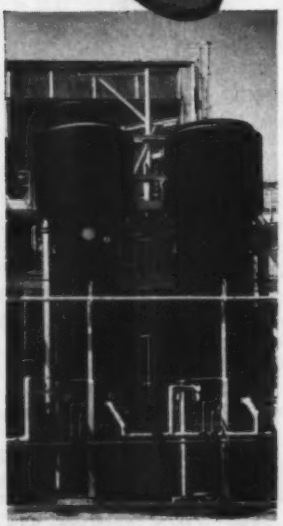
BLACK LIQUOR EVAPORATORS STAND OUT

THROUGHOUT THE PAPER PRODUCING INDUSTRY



G-B has been an outstanding supplier of Black Liquor Evaporators to the paper industry since 1934. Many new design innovations and cost cutting techniques can be attributed directly to G-B.

Write, wire or call for brochure #PP 509-1 giving complete details on G-B Black Liquor Evaporators.



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FILTERS • EVAPORATORS • PROCESS EQUIPMENT • CONTRACT MANUFACTURING including HEAVY CASTINGS

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NAMES IN THE NEWS

Continued from page 395

joined the department as control and analysis foreman.

Ben Erickson has been appointed assistant control and analysis foreman.

James McIntyre joins the department's pulping section as a process engineer. He has been serving as assistant superintendent of the company's Semichemical and Recovery Plant.

David R. Haskins has been named as quality control engineer.

Syracuse University

Dr. Hardy L. Shirley, dean, State University College of Forestry at Syracuse University, Syracuse, N.Y., has announced five faculty promotions.

Dr. William L. Webb has been promoted from associate professor to professor of forest zoology.

Dr. Maurice M. Alexander, was promoted from assistant professor to associate professor of forest zoology.

Dr. Allen F. Horn, Jr., was promoted from assistant professor to associate professor of forest management.

Frank W. Lorey is now associate professor of pulp and paper technology.

Dr. Arthur T. Viertel is now associate professor of landscape architecture.

International Paper Co.

George T. Ward, a vice president of the company since 1958, has been designated vice president in charge of manufacturing for the company's pulp, paper and paperboard operations in the U. S.

Leonard Dalsemer, vice president of the company and chairman of its subsidiary, Lord Baltimore Press, will move his headquarters to the company's executive offices, where he will assume special administrative duties within the company.

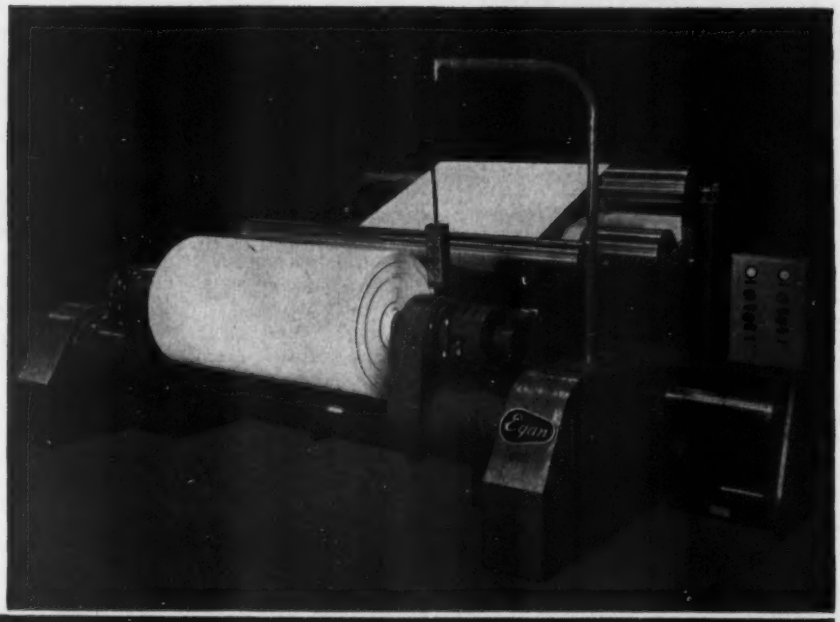
Numerous managerial changes have been made recently in the Southern Kraft Division of International Paper Co. in Mobile, Ala.

Erling Riis has retired as general manager of the Southern Kraft Division and is being succeeded by Arthur L. Ross who was assistant general manager of the division.

C. L. Crain, a veteran of more

Continued on page 398

The unit shown at right was installed at the S. D. Warren Company's Plant, Cumberland Mills, Me. It operates at speeds up to 1000 fpm and handles rolls 84" wide and 50" in diameter.



NEW...

EGAN SHAFTLESS UNWIND

Egan presents the newest . . . most advanced . . . most compact . . . shaftless unwind ever designed for unwinding and converting applications!

The Egan Shaftless Unwind has eliminated the cross shaft between the pick-up arms. This saves considerable floor space by permitting the use of extremely short arms. As a result, the unit is more rugged; more compact, and allows for greatly reduced gear loading.

Designed for floor pick-ups, the Egan Shaftless Unwind can be readily handled by one man. Motorized chucking of rolls is also possible with 3 I.D. cores and up. Automatic side-shifting can be provided as an optional feature, as well as constant tensioning. However, skew adjustment is considered to be a standard feature.

The unit's greater rigidity also assures better operation at high speeds. An Egan Shaftless Unwind, which will handle rolls 12" to 90" wide with diameters ranging from 14" to 60", is capable of speeds up to 3500 fpm.

LICENSEES
ENGLAND—BONE BROS. LTD., Wembley
FRANCE—CONST. MEC. ABC, St. Germain-s/Morin (S.-&-M.)
GERMANY—ER-WE-PA.—Erkrath bei Duesseldorf
JAPAN—MINAMI SENJU MFG. CO., LTD., (Agent)—CHUGAI BOYEKI CO.), Tokyo

REPRESENTATIVES
ITALY—ING. LEO CAMPAGNANO, Milano
MEXICO—M. H. GOTTFRIED, Mexico, D.F.

Write for complete details on your company letterhead.

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SOMERVILLE, NEW JERSEY CABLE ADDRESS: EGANCO—SOMERVILLE NJER

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PAPER SPECIALISTS

ARTHUR D. LITTLE, Inc., one of the world's largest, most versatile industrial research organizations, is expanding its sphere of activity with the paper industry.

HIGH caliber, technically trained men with 8 to 10 years diversified experience in the paper industry are being sought to be part of an ADL consulting team. These men will serve the paper industry in an analogous fashion to a company's Corporate Planning Department.

EXPERIENCE should include either pertinent research and development, mill technical or mill supervisory work. A knowledge of pulp and paper market requirements is also desirable.

QUALIFIED candidates may send a brief description of their educational and professional experience to:

DONALD P. SWEET

An equal opportunities employer

Arthur D. Little, Inc.

35 Acorn Park
Cambridge 45, Massachusetts

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NAMES IN THE NEWS

Continued from page 396

than 35 years with the company, has been promoted to assistant general manager.

John A. Lyden has been promoted to special assistant to the assistant general manager of the Southern Kraft Division.

Arthur F. Perkins has been promoted to manager of manufacturing. Perkins has been assistant manager in charge of engineering and construction in the division.

Arthur P. Foster is chief engineer in charge of engineering and construction. In his new position, he assumes the additional responsibility for engineering and construction formerly held by Perkins.

A. E. Levensailor, recently returned from New Zealand, has been named assistant to the manager of manufacturing in the Southern Kraft Division.

A. G. Rozyskie, manager of the company's mill in Camden, Ark., has been appointed assistant to the division manager of manufacturing.

James M. Van Hoose Jr., currently manager of the Natchez, Miss., mill, will transfer to Camden as mill manager there.

Emmett R. Jones, assistant mill manager at Natchez, will succeed Van Hoose as manager of that mill.

George C. Priest has been named to succeed H. C. McGough as power plant superintendent of the Pine Bluff, Ark., mill. Priest was power plant superintendent at Natchez.

E. E. Hennesy has been named to succeed George C. Priest as power plant superintendent at Natchez.

H. C. McGough, currently power plant superintendent of the Pine Bluff mill, will transfer to Camden as utilities, maintenance and engineering superintendent.

Richard "Rudy" Miles, paper mill superintendent at Camden, has advanced to production superintendent.

Thomas J. "Jack" Judge has been promoted to assistant chief engineer of the Southern Kraft Division. He will continue as division coordinator of power plants in addition to his new assignment.

William C. Stacks, Jr., assistant to the paper mill superintendent of the Natchez Mill of International Paper Co., has been transferred to Mobile, Ala. as assistant division pulp mill engineer for the Company's Southern Kraft Division.

Lyle

Lusby

Bowaters Carolina Corp.

Homer L. Lusby has been named superintendent of paper manufacturing for Bowaters Carolina Corp., Catawba, S. C. Lusby was most recently associated with Continental Can Co. as assistant to the general manager paper and board.

Hubert M. Lyle has been appointed superintendent of finishing and coating for the company. Lyle was most recently employed by St. Francisville Paper Co.

Merrimac Paper Co. Inc.

Robert J. Van Nostrand has been named president of Merrimac Paper Co. Inc., Boston, Mass. Formerly with Brown Co., Van Nostrand is a member of TAPPI and SAPI.

Van Nostrand

Schmidt

Lamb-Grays Harbor Co. Inc.

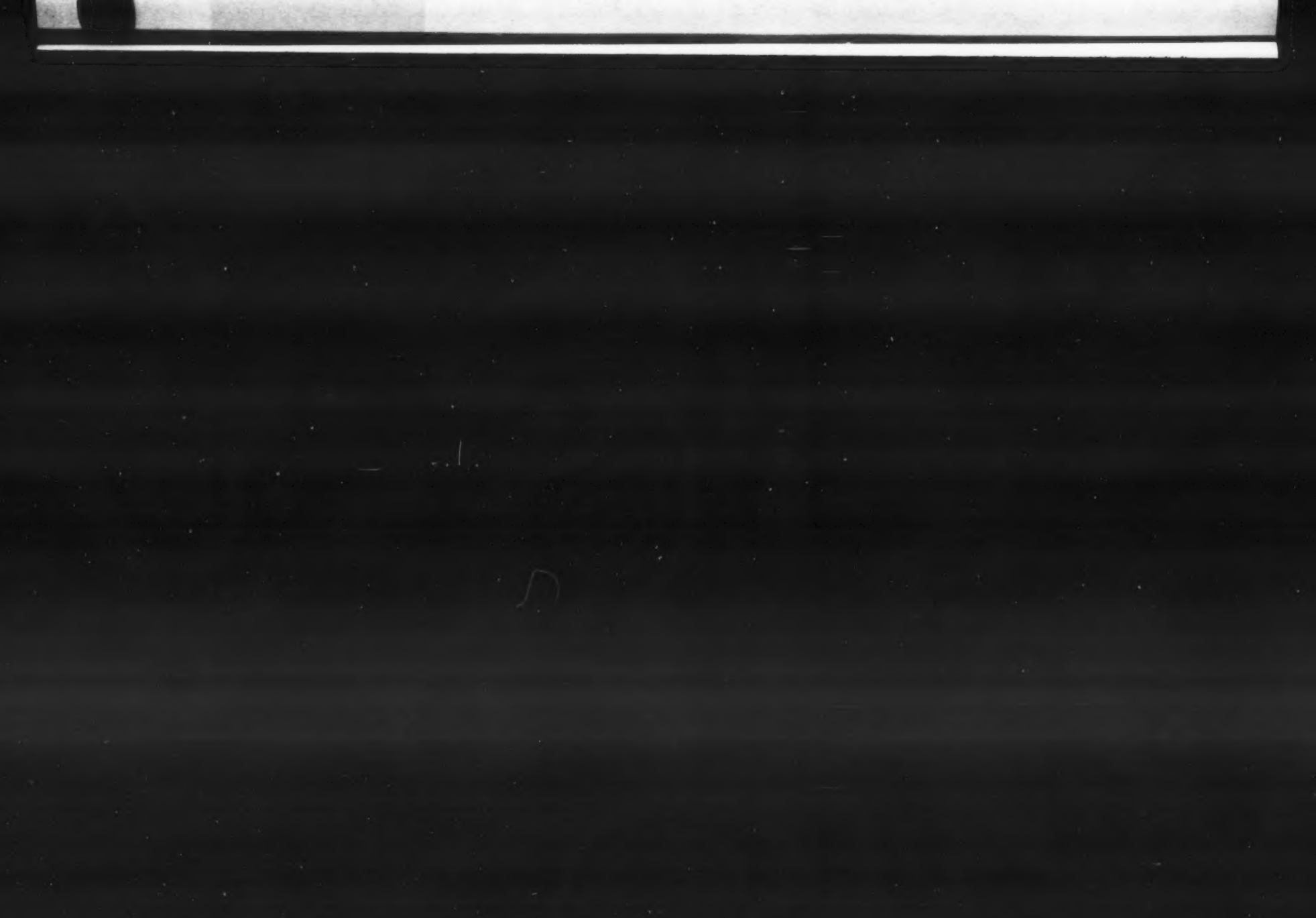
Werner P. Schmidt has been appointed Scandinavian sales and technical representative by this company of Hoguiam, Wash. With offices in Saltsjobaden, near Stockholm, Schmidt will handle sales, installation, and start-up services for all finishing systems and equipment in Sweden, Norway and Finland.

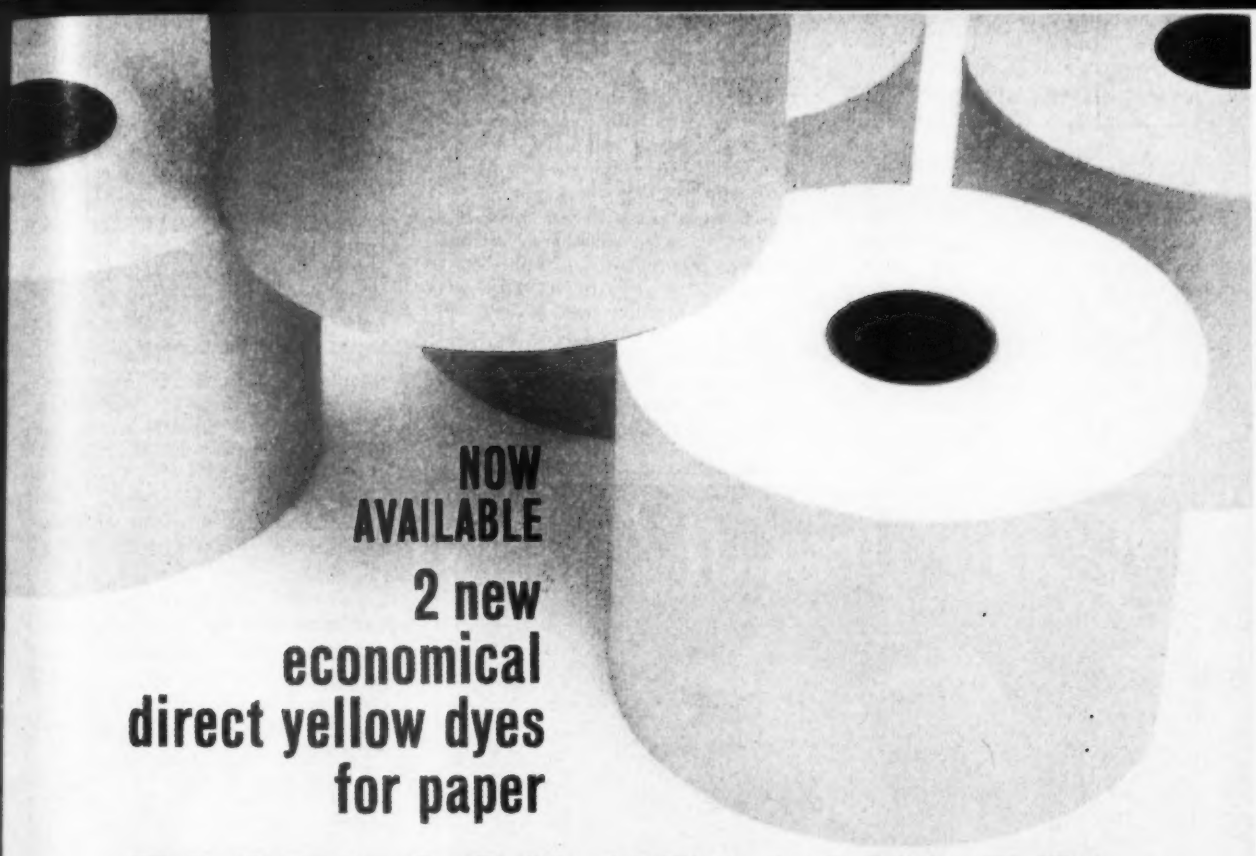
Container Corp. of America

Fred P. Ritchie has been appointed to the position of general manager of the Santa Clara, Calif., paper mill. He formerly was plant manager at Santa Clara.

Roland E. Boedeker was promoted to general manager of the 57th Street mill in Los Angeles. He was production engineer at the Lake

Continued on page 400





NOW AVAILABLE

2 new economical direct yellow dyes for paper

FASTUSOL® YELLOW RP
FASTUSOL® YELLOW RG

The dyes used in the coloring of paper add considerably to the cost of the finished sheet. GDC has now developed two new, low-cost, non-dusting direct yellows which offer all the benefits of a premium direct dye at minimum expense.

These new FASTUSOL YELLOWS produce extremely light-fast and bright greenish-yellow shades of the highest degree of even-sidedness. They are ideal for coloring all types of paper—bond, ledger, cover, text, etc.—both sized and unsized.

FASTUSOL YELLOW RP and RG are readily bleached with chlorine for simplified re-use of broke. They can be added dry to the beater without danger of showing color specks. They show no indication of burning-out or migration, hence being eminently suitable for coloring board dried at high temperature.

Try these dyes now in your furnish. The quality of our dyes is backed by the finest skilled technical service and prompt deliveries.

Write or call our nearest sales office for samples and additional information.

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FASTUSOL YELLOW RP AND RG, MANUFACTURED BY GENERAL ANILINE & FILM, ARE SOLD OUTSIDE THE UNITED STATES AND CANADA UNDER THE TRADENAMES, "FENALUZ YELLOW RP AND RG," BY DISTRIBUTORS ALL OVER THE WORLD.

NAMES IN THE NEWS

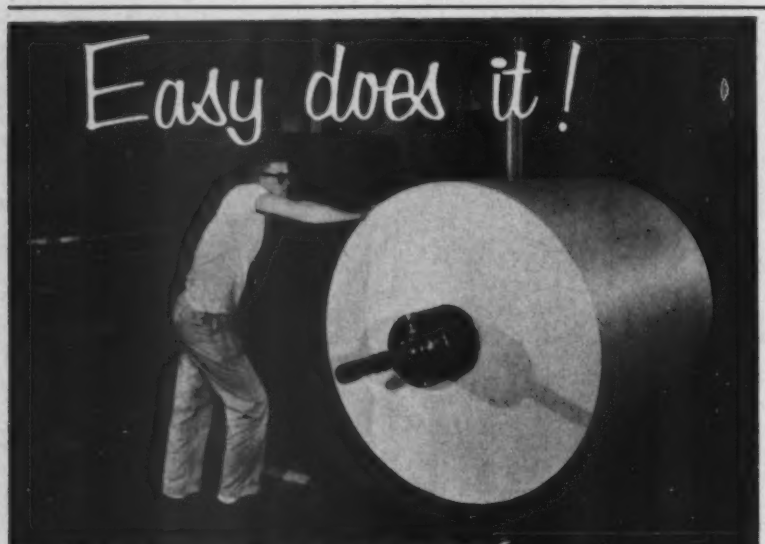
Continued from page 398

Shore mill, Chicago, and plant manager at Los Angeles.

G. William Colvin has been appointed general manager of the southeastern division corrugated shipping container plants for this Chicago-based company. Colvin will be responsible for the plants located in Nashville, Knoxville and Chattanooga, Tenn., Winston-Salem, N. C. and Fernandina, Fla. His headquarters will be in Winston-Salem.

Everett O. Jones has been appointed general manager of the Anderson, Ind., corrugated shipping container plant of the company.

Albert L. Ahlers has been appointed general manager of the company's corrugated shipping container plants in the central-east division. In his new post, Ahlers will headquarter at the Louisville, Ky., plant. Ahlers will be responsible for the container plants at Anderson, Ind., Cincinnati, Ohio, Lexington and Louisville, Ky.



. . . To Transfer Finished Rolls
• SAFELY • ECONOMICALLY

MURCO HYDRAULIC ROLL LOWERING TABLES

Transfer of finished roll of paper is an easy and safe operation with MURCO Hyraulic Roll Lowering Tables. Not only is the paper transferred easily but there is no damage to the paper roll. MURCO Hydraulic Roll Lowering Tables do away with complicated, expensive recessed elevators or cumbersome overhead hoist arrangements. In transferring paper there is no bending or breaking of the winder shaft as the shaft is never used as a lifting arbor. The rigid construction of MURCO Hydraulic Roll Lowering Tables positively prevents movement when the table is loaded . . . compact, they occupy small floor space (note the plant view at the right). Made in sizes practical for any normal size paper roll.

Write: today for quotation on size to meet your plant operation . . . state height from floor to winder . . . . length of paper roll; diameter of paper roll; weight of typical paper roll.

MARATHON SOUTHERN CORP.
Naheola, Alabama

WAUSAU PAPER MILLS
Brokaw, Wisconsin

CHARMIN PAPER PRODUCTS CO.
Cheboygan, Michigan division
on #9 paper machine

D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1883
WAUSAU, WISCONSIN

For more data circle 138 on Post Card

A. E. Staley Mfg. Co.

Ely Balgley has been named director of this company's new market research department Balgley will provide current and projected information on markets for new products from the Decatur concern and its U B S Chemicals Co. Division at Cambridge, Mass.

Allied Chemical Corp.

James F. Adams, Jr. has been transferred to the New York office of this company as assistant to the director of sales, in the Solvay Process Division.

Alexander H. MacDonell succeeds Adams as manager of technical service in the Syracuse, N.Y. office.

Halifax Paper Co.

William Harry Peale, Jr. has joined the Halifax Paper Co., division of Albemarle Paper Mfg. Co., Roanoke Rapids, N.C. as technical supervisor.

Robert L. Whiteman, Jr., has joined the design engineering department as design engineer.

NECROLOGY

Eugene E. Schweitzer

Eugene E. Schweitzer was widely known in the paper industry. He had been with Oxford Paper Co. for 24 years and at the time of his death, was the company representative in charge of sales of Export, Job Lots and Seconds and was located in the company's New York office.

Carl Arne Olsson

Carl Arne Olsson was a director and vice president and general woodlands manager of Chesapeake Corp. of Virginia, West Point, Va. His father reorganized Chesapeake Pulp & Paper Co. and founded the present company.

George L. Bidwell

George L. Bidwell was retired president and general superintendent of Regal Paper Corp. Bidwell was a developer of some fifty processes used in paper making.

Eugene Zellerbach

Eugene Zellerbach was son of the founder of Crown Zellerbach Co. Eugene was not associated with the firm when he died.

1961 SAFETY CONGRESS — Have you made plans to attend?

FROM October 16 through October 20, the 49th session of the Pulp and Paper Section will meet at the Conrad Hilton Hotel in Chicago. The program committee, headed by Vince P. Coulon, has worked hard through the year to arrange a very promising program. Some of the highlights are listed here.

MONDAY (OCT. 16) — Harry M. Gray, of Sealright-Oswego Falls Corp., will give an opening address on "A New Challenge for Safety". Other general reports will be given at this opening meeting along with the election of the 1961-62 officers.

TUESDAY (OCT. 17) — Open session includes: "Increased On-the-Job Fire Training" by M. M. Batzer, industrial fire prevention trainer; "Aids in Influencing Human Behavior" by Glenn F. Griffin, industrial training consultant; and "Off-the-Job Safety" by W. F. Leonard Jr. of Southland Corp.

WEDNESDAY (Oct. 18) — The Pulp & Paper Mfg. Section will offer the following: "Radioactive Isotope System in the Paper Industry" by E. J. Amberg of Industrial Nucleonics Corp.; "Safety Is Built Into The Kamyr Continuous Digester" by O. A. Laakso of Kamyr Inc.; and "From These Forests", a motion picture produced by International Paper Co.

THURSDAY (Oct. 19) — Annual Joint Luncheon with the Wood Products Section. At this luncheon, the presentations of the safety awards will be made — Edward Benton Fritz Award, given by Fritz Publications Inc.; and the Arthur Hoyt Scott Award, given by Scott Paper Co. Chester Lauck of Continental Oil Co., as guest speaker, will speak on "The Human Side of Accident Prevention".

Annual sectional meetings on Paper Converting and a joint session with the Wood Products Section will also be held on Thursday afternoon after the luncheon.

Registration and reservations

Registration and information desks will be located in the Conrad Hilton Hotel. Delegates may register on Sunday (Oct. 15) from 10:30 a.m. to 8:00 p.m. On Monday through Thursday, the hours will be from 8:00 a.m. to 4:30 p.m.

Delegates may secure hotel reservations by writing to: Housing Bureau, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

First report on 1961 safety contest

FOR THE FOUR MONTHS ended April 30, some 534 contestants reported perfect scores in the 1961 Paper Industry Safety Contest sponsored by the National Safety Council. The number of mills reporting in September was 715.

The January-April frequency rate for all divisions (except pulpwood logging) was 6.50, a 1-per-cent decrease from the same period in 1960. In the Pulp & Paper Division, the four-month rate was 6.13, a 4-per-cent increase from a year ago. In Paper Converting, a rate of 7.33 meant an 8-per-cent decrease from a year ago. Pulpwood Logging reported a rate of 27.21, down 1 per cent from last year.

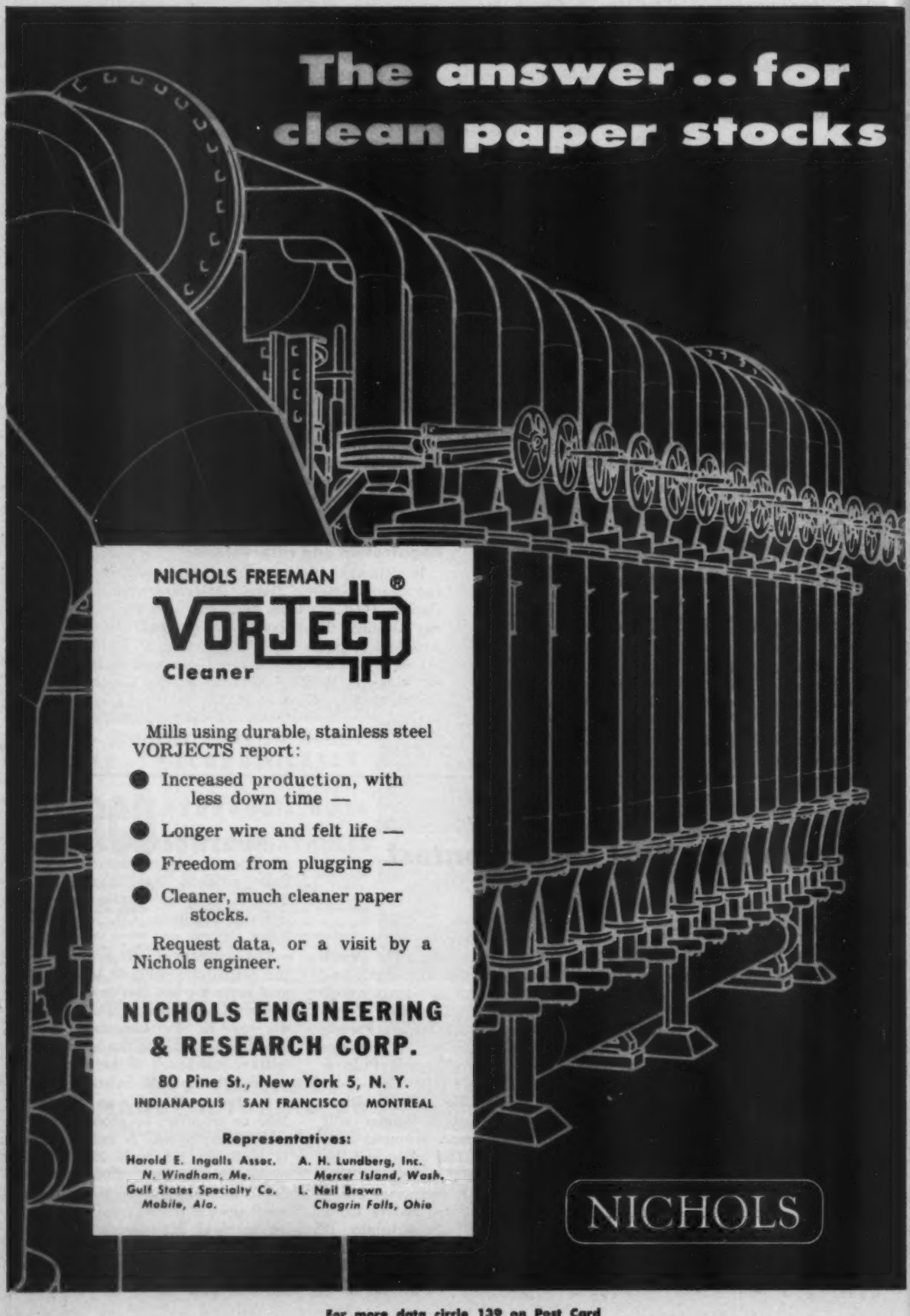
Contestants working the most manhours in the January-April period with lost-time accidents were: Olin Mathieson Chemical Corp., Ecusta Paper Div., Pisgah Forest, N.C.; P. H. Glatfelter Co., Spring Grove, Pa.; West Virginia Pulp & Paper Co., Tyrone Mill, Pa.

From the eligible mills in Division I, the board of judges will choose the mill with the most outstanding record. This plant will be awarded the grand prize—the Edward Benton Fritz Memorial Tropy —during the National Safety Congress in October. This trophy is presented each year by Fritz Publications Inc., publisher of THE PAPER INDUSTRY.

A SAFETY CAMPAIGN to work a million manhours without a lost-time accident was completed on June 9, 1961, by employees of the Sonoco Products Co., Hartsville, S.C.

The company's 1900 employees at the plant have worked toward this goal since the last lost-time accident occurred on March 4, 1961, according to E. P. Langston, safety coordinator. This is the second safe million manhours to be completed during the last 12 months.

A "Safety Kitty" was started in 1953 as an effort to promote safety to all employees. A cash reserve is built up for each 250,000 safe manhours worked. Company officials feel this reserve is an investment since it results from not having an accident. Employees of Sonoco will decide on how to distribute the prize money they won by this new record.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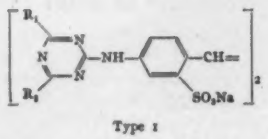
Fluorescent whitening agents in papermanufacture

Two main types of "optical bleaching" agents used in the paper industry consist of di-substituted 4, 4'-diamino-2, 2'-disulphonated stilbenes. Most of these have the general structure given in Figure 1. By carefully choosing the proper substituents R_1 and R_2 (shown in the figure), agents with the suitable performances are produced. The sulphonic acid groups give rise to water solubility, which may be increased or diminished at will by introducing the appropriate substituents R_1 and R_2. The application of such brighteners is described, both in the beater and at the surface. The use of shading dye-stuffs in conjunction with whitening agents is being widely accepted. Such shading dyes are especially beneficial in the production of "super-white" or "high white papers". The following experiments are described in testing bleached sulfite pulp (at 40° S-R.): the quenching effect of sizing and of back water, on brighteners; the quenching effect of the prior addition of papermakers alum, and the effects of alum on unsized papers and on dilute solutions of the whitening agents. Fluorescence of the patterns measurements are also alluded to.



Type 1

Figure 1

A.J. Hinton. **Paperi ja Puu 43**, 111-14 (1961) (In English).

Hydrotropic solvents for prehydrolysis in preparing viscose pulps

Sodium benzoate solutions were used in effecting prehydrolysis of birch followed by soda digestions and bleaching. Hydrotropic solvents, like the benzoate, could not be used with softwoods. A sodium benzoate liquor (such as that used in cooking poplar) could be recycled up to five times, when birch was the raw material. The best conditions for prehydrolysis involved 45 per cent benzoate solutions, heated 60 min. to 120°C., kept one half hr. at this temperature, then brought gradually to 150°C. and kept at this temperature for 30 min. The approximate pH was 6.0 to 7.5. Subsequently, the most satisfactory cook was made with 20 per cent sodium hydroxide based on the dry wood, and heating 1 hr. to bring the temperature to 170° and keeping this for 1 hr. Apparently, the main function of the benzoate was to improve the accessibility of the liquor to the lignin area. In practice, the pulps made by the use of benzoate prehydrolysis, were somewhat inferior in properties to those in which only water was used as the hydrolyzing medium, but after proper refining these differences were reduced. The lignin content (lowered by using the benzoate) compensated for the loss of strength, especially in the case of dissolving pulps. In the subsequent bleaching trials an attempt was made to lower the pentosan content as far as possible by using a relatively strong caustic soda extraction, and sulfurous acid was used to lower the ash content. When this was done, the pulp contained 94 per cent alpha cellulose, 6.5 per cent pentosans and only 0.05 per cent ash. It had an average deg. of polymerization of 330 to 360 and 84-85 per cent G.E. brightness. Even so this was still not suitable for viscose manufacture, due mainly to the residual pentosan content. The industry in France requires that the pentosan content be below 3 per cent. In spite of this limitation, the hydrotropic prehydrolysis is of some interest, due to the high rate of delignification (at an approximate pH of 7.0) and the ease in recovering the benzoate, as well as the possibility of recycling the initial solvent.

Eight references. A. Robert and G.Noisillier. **Assoc. tech. ind. papeterie, Bull. 1960,** 15-34 (Original in French, with brief summaries).

Packaging of printing papers

This is a discussion, in which various questions are answered, by both papermakers and printers. As a result the following were emphasized. Paper, when delivered to the printer, should tend rather to lose moisture than to gain it. Every paper package, whether in the form of reams, pallets or reels, should be treated with paraffin wax or some other moisture-proofing material, or at least with asphalt. When these packages are opened by the printers, this should be done near the presses. Publishers should realize that it is preferable to purchase a more expensive paper than a cheap one provided the former serves to give a better output.

G. Martin (moderator). **Assoc. tech. ind. papetiere, Bull. 1960, No. 1** 37-41 (Original in French, with summaries in English, German, Spanish and Italian).

Oxidation of sulfate black liquors

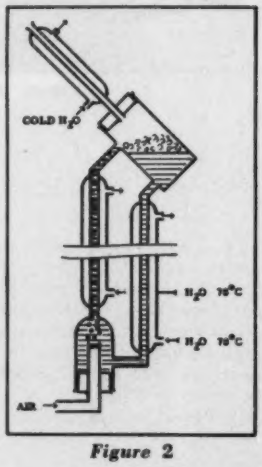


Figure 2

A comprehensive study was made of the changes in sulfur compounds, when black liquor alone, or, in admixture with white liquor, was subjected to partial oxidation by means of air. For liquors of certain compositions, appreciable amounts of polysulfides may be formed together with thiosulfate, sulfite and small amounts of sulfate. Reactions between the sulfur compounds are possible, and since ordinarily no equilibrium is reached during the oxidation, further changes will normally occur during liquor storage. Thus, during storage of the partially oxidized black liquor, amounts of polysulfides and sulfite will decrease with the formation of thiosulfate. Usually the amount of polysulfide formed during the oxidation will be higher than that of the sulfite, and this often will also be the case after storage, although this is not invariably true. Reactions taking place when mixtures of black and white liquors are subjected to oxidation are usually different from those in black liquor alone. Here too, sulfite is formed, and some sulfite and polysulfides are changed during storage; the total amounts of the polysulfides (after oxidation) actually increase during storage. At the same time the sulfides decrease, and it seems probable that this polysulfide increase during storage is due to a reaction between the sulfide and some oxidized organic compound. The post oxidation formation of the polysulfides was found only when high amounts of sulfites were present during the oxidation, and it seems that sulfide plays a role in the formation of the oxidized organic compounds. The highest amounts of

the polysulfides were found when mixtures containing 30 to 50 per cent white liquor was present, and this is a normal composition of kraft cooking liquor. Thus by suitable oxidation and storage, as much as 44 per cent of the oxidized sulfide sulfur had been transferred to the polysulfide. The amounts of polysulfides obtained by partial oxidation of suitable mixtures should be high enough to insure passivity of the digester steel during the cook, and can then also be beneficial in the pulping process by giving increased yields. In many mills the sulfidity of cooking liquors is relatively high, and the decrease in this sulfidity due to oxidation should not be harmful to pulp quality. Figure 2 shows schematically, the apparatus used in these oxidations.

Eleven references and 7 figures are included. E. Bilberg and P. Lamdmark. **Norsk Skogind 15, No. 5,** 221-238 (1961) (In English).

Abnormal wood fibers

A review is given of the compression wood obtained from conifers and the tension wood derived from hardwoods, and results are given of a study carried out at the Institut für Faserstoff-Forschung, in Berlin, Teltow-Seehof, dealing with the production and processing of pulps made from these reaction woods. The author also discusses the possible origin and growth of reaction wood cells, and experiments carried out with the deliberate formation of tension wood. The inhibition of the synthesis of lignin appears to be connected with the accelerated rate of growth, and is shown to occur at the very beginning of the lignin synthesis, thus preventing stages that normally would lead to lignin formation. The excellent orientation found in aspen wood fibers is shown in the x-ray diagram in Fig. 3. In an analysis of **Ailanthus** tension wood, and normal wood, the respective percentages of lignin were 15.9 and 24.9, pentosans, 19.0 and 26 per cent, and cellulose 53.5 and 40.3 per cent. Tension wood produced by bending a seedling of chestnut gave rise to considerable tension wood, excepting when a portion of the bent area was protected by a mantle of gypsum. In the latter case no tension wood appeared, but below this area tension wood formed. This "gypsum mantle" is shown in Fig. 4.

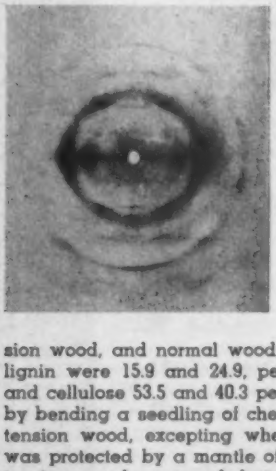


***Figure* 3**

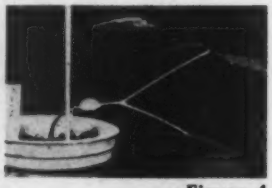


***Figure* 4**

Sixteen references. Erich Correns. **Paperi ja Puu** (Finland) **43,** 47-62 (1961) (In German).

Pulping Acacia deabata, Link

This wood belongs to the wattle family and its bark contains commercial tannins. Since these trees are fast-growers and, more frost-resistant than is the usual wattlewood, their use as pulpwood was studied. A sample of Acacia deabata, five years old, containing 49.5 per cent alpha cellulose, 21.9 per cent lignin, 18.5 per cent pentosans, 3.47 per cent hot water solubles and 2.82 per cent alcohol-benzene extractives, was subjected to kraft pulping and gave 55.6 to 56.9 percent pulp with a Roe number of 2. Initially this pulp beat faster than did that from Japanese pine (Pinus thunbergii) but in the later stages, hydration proceeded more slowly. Strength properties, especially tear and fold, did not reach those of the pine pulp. Blends of pine pulp with 10 to 50 per cent of the Acacia pulp showed only gradual strength decreases, with increases in elongation (excepting in the case of the folding number). Fiber dimensions were determined. The ray cell content was much lower than in beech but far greater than in birch. Alcohol-benzene extractives could be reduced to 0.22 per cent, which should make the fibers suitable for a rayon grade pulp, provided the pulp (when bleached) included an alkaline extraction with 10 per cent sodium hydroxide at 130° C.

Koichiro Kitao. **Wood Research** (Kyoto) **No. 22,** 30-34 (Oct. 1959), (Original in Japanese with English summary); through **Abstr. Bull. Inst. Paper Chem. 31,** No. 11, 1676-7 (1961).

Kinematic high frequency and ultrasonic treatment of pulps

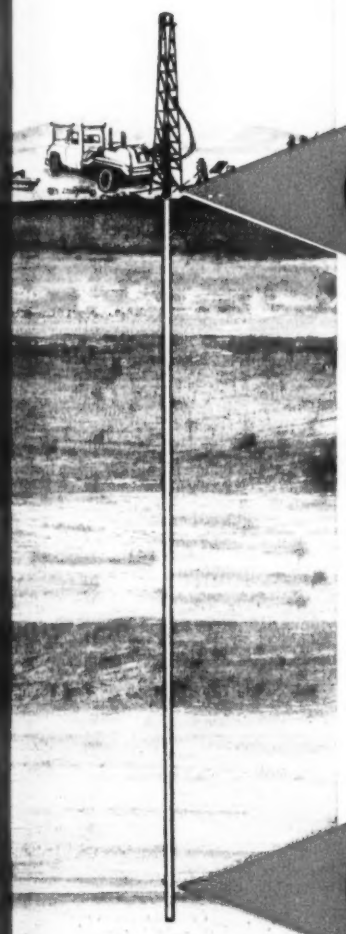
For over twenty years, investigations have been made with a view toward applying ultrasonic energy to the treatment of pulps, but these seldom advanced beyond the stage of laboratory experiments. Often the fiber structure was damaged and the pulp strength was impaired to a point which interfered with improvement in sheet quality. The present author has developed a new method for producing ultrasonics by kinematic means, and has been able to treat paper pulps industrially, and makes claims of marked improvements in their physical properties. Details of this work are given together with appropriate illustrations. Features include a rapid subdivision of the pulps and rapid distribution and passage through 500 to 1000 acoustic reaction chambers, which are so "excited" that they serve as oscillating generators of sonic and ultrasonic waves, with the pulp slurries divided into fractions ranging from 0.1 to 0.8 milliliters. The equipment permits a number of brief ultrasonic treatments of the pulps.

Micrographs of the treated pulps and 37 references are given. P. Willems. **Assoc. tech. ind. papetiere, Bull,** 1960, **No. 2,** 66-83 (In French, with summaries in English, German, Spanish and Italian).

Cation exchangers from spent sulfite liquors

The undiluted spent liquor was fermented and gave about 10 liters of ethanol per cubic meter of the solution. After separating the alcohol, the liquor was treated either with sodium carbonate or with lime and carbon dioxide, giving respectively a mixture containing either 11.5 to 13.2 per cent or 6.8 per cent of inorganic components. The lignosulfonic acid (in the presence of hydrochloric acid catalyst) is condensed with formaldehyde, and the effects of the relative amounts of the acid catalyst and the aldehyde, as well as the temperature are of importance in the initial condensation reaction. These were studied, together with the effects of temperature and formaldehyde vapors on the curing (or hardening) reaction, and on the swelling and ion-exchange properties of the resulting resins. Increasing the temperature and (or) the amount of aldehyde or catalyst in the early stage of the reaction lowered the ion-exchange capacities of the condensates, because of the partial removal of the sulfonic acid groups. The time required for condensation increased with increasing amounts of the formaldehyde, but decreased with increasing temperature and concentration of the acid catalyst. The optimum temperature of 140°C. in the second stage (**i.e.** the curing) reaction, gave satisfactory resins with good ion-exchange capacity in a much shorter time period than that required when the temperature was 85° to 90°. The presence of formaldehyde vapors greatly accelerated the curing reaction (which was then 27 times as rapid as in their absence). Extended thermal curing increased the mechanical strength properties of the resins but reduced their swelling and ion-exchange capacities, and their porosities. This was noted especially when the spent liquors contained higher mineral contents. Evidently the inorganic constituents favored the thermal removal of sulfonic acid groups.

Thirteen references. M.Dima, Gh.V.Cotrut, I. Scondac and I. Petrariu. **Acad. rep. populare Romîne, Filiala Iasi Studii cercetări stiint. Chim. 11,** No. 1 103-37 (1960) [Original in Romanian, with Russian and French summaries; through **Abstr. Bull. Inst. Paper Chem.** 31, No. 10, 1526-27 (1961)].



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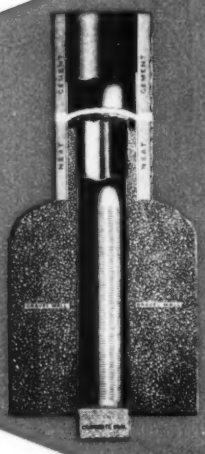

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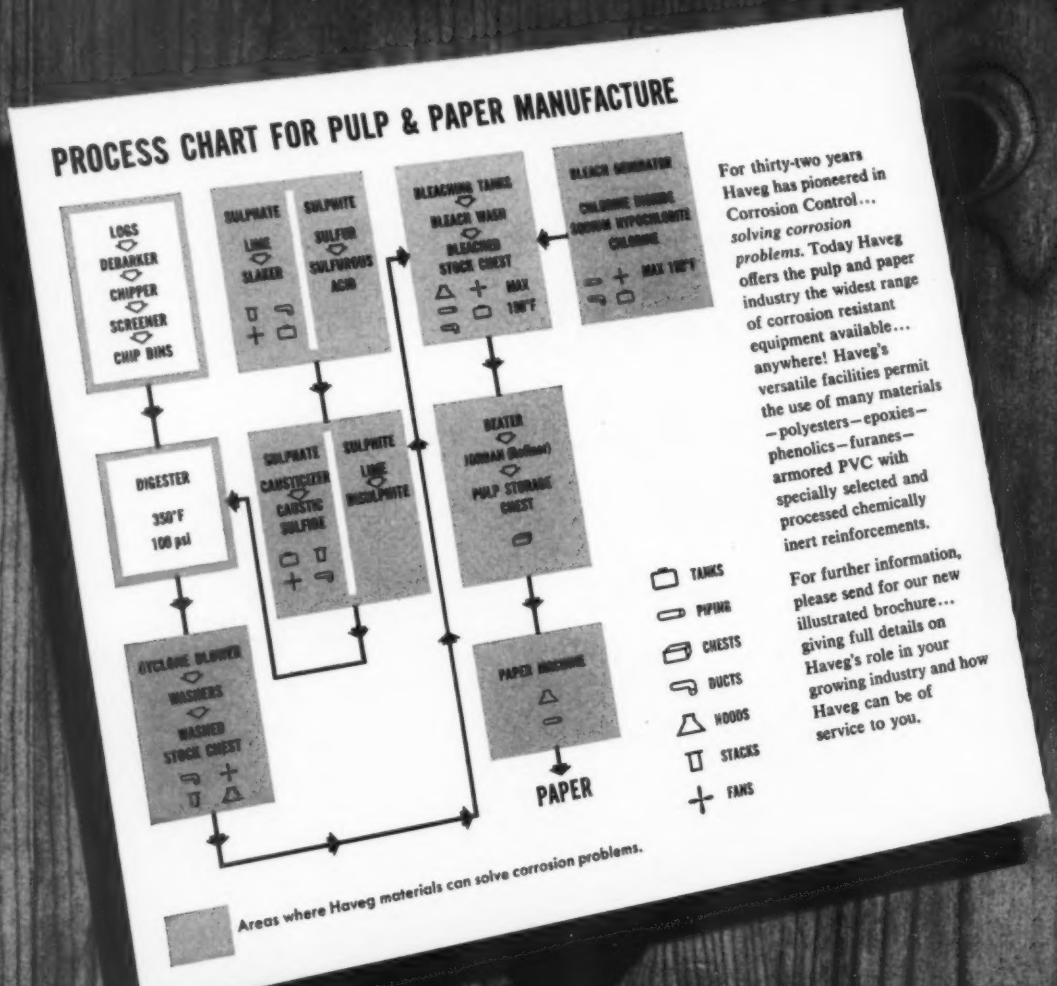

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Dr. Melvin Nord

Control of stock supply in paper making machines

U. S. 2,970,938, issued Feb. 7, 1961, to Frederick R. Erbach and assigned to Beloit Iron Works provides apparatus and a method whereby a suspension of paper fibers in water or paper stock to be supplied to paper machines through a conduit at a relatively high velocity can be controlled and have its velocity progressively reduced as it is led always upward to be delivered under the liquid to the air surface of stock in the vat inlet portion of the machine to prevent undesirable surface splashing and other flow disturbances.

As shown in Fig. 1, a hollow cylinder roll or mold 10 is supported at each end in a vat 11. The vat 11 includes a

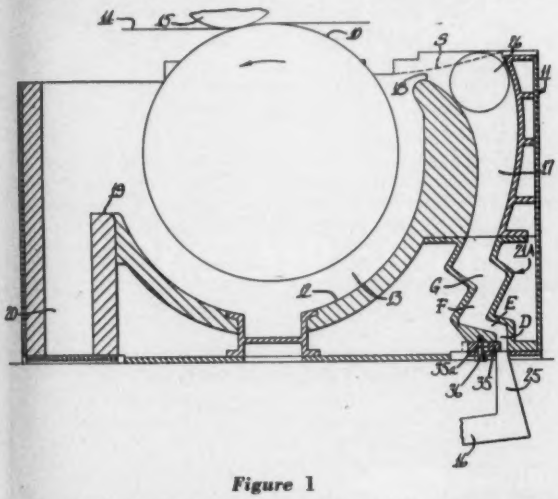

***Figure* 1**

hemicylindrical bottom or vat circle 12 which defines with the surface of the cylinder mold a substantially hemiannular passage 13, known as the vat circle space. Suitable seals are provided at each end of the mold 10 to prevent stock from flowing into the interior thereof.

As the cylinder mold 10 rotates, it will be partially immersed in a quantity of stock contained in the vat, wherein water from the stock, commonly called white water, passes through the perforated surface of the cylinder mold and leaves a web of fiber deposit on it. This web of fiber is removed from the cylinder mold 10 near the top by causing it to adhere to the underside of an endless pick-up felt 14 pressed against the cylinder mold forming surface by a couch roll 15. White water collected on the interior of the cylinder mold 10 flows from both ends of the cylinder and the vat to be delivered to a white water storage or deaerating tank for further usage.

Counterflow operation of the cylinder machine is attained by delivering dilute aqueous stock through a conduit 16 to the vat inlet 17 over an associated making board 18 to the adjacent upper end of the vat circle space 13. The stock then flows downwardly against the rotation of the cylinder mold 10 and around the vat circle space 13. If overflow operation is desired, the stock will continue to flow around the vat circle space 13 and leave the opposite end to flow over a board 19 and out of the vat through a vat outlet 20.

It is essentially important that little or no splashing or surface disturbance be encountered on the open top surface S on the inlet side to the cylinder vat circle space 13 in order to reduce, if not eliminate the making of defective paper on the cylinder mold. To this end, the instant invention provides means in the vat inlet 17 capable of gradually reducing the submerged discharged stream of velocity to a point where surface flow rates avoid serious surface disturbance. This means is in the form of an expanding deflector arrangement 21A which forces the incoming stream of stock against inclined surfaces, while changing or alternating the flow direction of the stock and sending it through passages of gradually increasing sizes or cross-sectional areas, while this flow of the stock is confined to an upward direction. At the outlet of the vat inlet 17, a rectifier roll 26 is provided that serves to agitate the stock at this point.

Pyrolysis of waste sulfite liquor

U.S. 2,972,520, issued Feb. 21, 1961, to Gerald L. Eaton and assigned to United Engineers & Constructors Inc., provides a process for the pyrolysis of ammonia-base waste sulfite liquors, in which recovery of a maximum amount of carbon black is made possible.

As shown in Fig. 2, the system includes a pyrolysis conduit 10 which empties into a separation and recovery apparatus. The conduit 10 has an inlet 9 for hot gases and a Venturi constriction 12. A line 8 is provided for carrying hot gases from a source 7 which may be a boiler, or a furnace or other combustion device, to the inlet 9. A line 14 is provided for introducing feed material into the conduit 10 at the constriction 12.

The separation and recovery apparatus is that conventionally used for recovering carbon black from a stream of hot gasses and consists of a spray tower 13 having a downwardly facing spray device 15 to which coolant is supplied through a line 16. A duct 17 is provided for bringing material emanating from the top of spray tower 13 to a set of electrostatic precipitators 18, 19. Basically they comprise chambers 20, 21 having suspended therein a series of wire electrodes 22, 23. Hopper shaped portions 24, 25 at the bottom of the chamber are provided for collecting precipitated solids. The hopper portions each empty into a conveyor 26 by means of which the solids are collected.

A duct 27 is provided for conveying material from precipitator 19 to a system of cyclone separators 28, 29 arranged in series. The cyclones also empty into conveyor 26.

In operation, a high temperature gas such as steam, flue gas, or a combination of the two is delivered from source 7. through line 8 to the inlet 9 of conduit 10. Preferably this gas

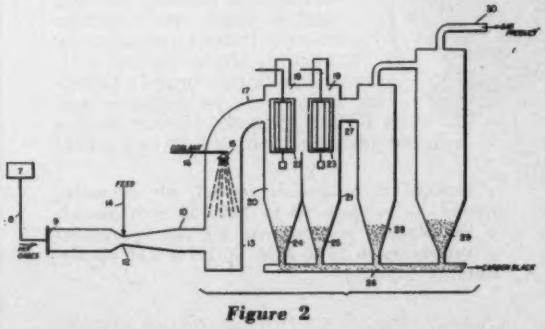

***Figure* 2**

contains some oxygen. It is at a temperature between about 2500° F. and about 4000° F. and at a pressure of between about 2 and about 300 psig. Moving down the conduit, it enters the constriction 12. Here a stream of the waste sulfite

material to be pyrolyzed is introduced through the line 14. The velocity of the hot gas in the constriction is between about 200 and about 700 ft. per sec. and the impact of this high velocity gas atomizes, vaporizes and pyrolyzes the waste material. The extremely high resultant temperature of the combined stream, say about 2200° F. to 2600° F. decomposes the lignin sulfonic acid and sugars and liberates sulfur dioxide; and at the same time vaporizes and pyrolyzes the carbonaceous portions of the ligneous material. After a total contact time on the order between about 0.1 and about 0.5 sec., the combined stream of hot gas and pyrolyzed waste material is delivered into the spray tower 13 where it is met with an aqueous spray delivered through spray device 15. By this means, it is cooled to say 300° F. to 1500° F.

The cooled material is then moved through duct 17 into precipitators 18 and 19 where a certain proportion of the carbon black solids are removed. The remainder is delivered with entraining gases to the cyclones 28 and 29 where substantially all the carbon black remaining in the gases is removed. The carbon black separated in precipitators 18 and 19 and in the cyclones 28, 29 is collected as a single stream by conveyor 26.

Incorporating oil in hardboard

U.S. 2,978,382, issued April 4, 1961, to Harland H. Young and Edward J. Majka, assigned to Swift & Co., provides a method of manufacturing an oil-tempered fibrous hardboard.

A water slurry is formed of fibrous material with a binder dispersed throughout. The binder is precipitated onto the fibrous material. A non-emulsion suspension is formed by suspending in the water slurry a finely divided fat-retaining material containing a drying oil. The fibrous material and the oil-soaked, fat-retaining material are then felted onto a screen to form a fibrous mat. The fibrous mat is then hot pressed to remove excess water and to distribute the drying oil throughout the mat. The mat is subsequently heated to polymerize the drying oil.

Pulp manufacture

U.S. 2,969,113, issued Jan. 24, 1961, to Frank B. K. Green and assigned to Sprout, Waldron Co. Inc., provides a method for continuously processing wood chips through cooking and digesting steps, to produce pulp.

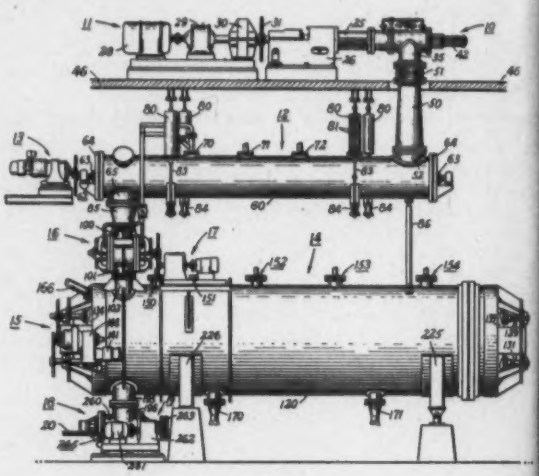

Figure 3

As shown in Fig. 3, the apparatus consists of feeding apparatus 10 for introducing the wood chips into the digesting system, pre-steaming apparatus 12, cooking or digesting apparatus 14, a rotary valve 16 for delivering and metering chips from pre-steamer 12 into digester 14, and discharge apparatus 18 for discharging the cooked chips from digester 14 through blow line 20.

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Other Patents of Interest

Subject	Inventor or Assignee	Patent No.	Date
Folding paperboard carrier for bottles	Continental Can Co. Inc.	2,965,261	12/20/60
Paper coffee cup	Michael N. Brillis et al	2,965,274	"
Folded blank box	W. R. Grace & Co.	2,965,277	"
Compartmented carton	Container Corp. of America	2,965,278	"
Tray	Continental Can Co. Inc.	2,965,279	"
Carton	Charles J. Miller	2,965,280	"
Sliced bacon package	Waldorf Paper Products Co.	2,965,283	"
Paperboard can holder	Continental Can Co. Inc.	2,965,410	"
Process for sizing	Corn Products Co.	2,965,518	"
Paper cup blank	Thomas N. Cummings et al	2,966,292	12/27/60
Cardboard box	Morton Goldsholl	2,966,293	"
Device for pulping fibers	Kalamazoo Industrial Services Inc.	2,966,313	"
Measuring the moisture content of paper	Frieseke & Hoepfner, G.m.b.H.	2,966,628	"
Paperboard carrier	The Mead Corp.	2,967,003	1/3/61
Combined paper cup and package	Goldene Shaw	2,067,609	1/10/61
Tinsel packaging carton	National Tinsel Mfg. Co.	2,967,653	"
Polygonal carton	Massillon Container Co.	2,967,655	"
Wax coating composition for paperboard	The Atlantic Refining Co.	2,967,781	"
Paper screening tapes for high tension electric cables	Pirelli Societa per Azioni	2,967,902	"
Paper coating machine	Philip A. Peterson	2,968,279	1/17/61
Carton	American Box Board Co.	2,968,392	"
Windshield shipping carton	Union Bag-Camp Paper Corp.	2,968,395	"
Container	Esso Research & Engineering Co.	2,968,397	"
Carton for dispensing paper products	Fibreboard Paper Products Corp.	2,968,431	"
Gusseted pasted valve bags	Bancroft Bag Factory Inc.	2,968,432	"
Manufacture of a moldable and extrudable lignocellulose product	Durel Inc.	2,968,573-4	"

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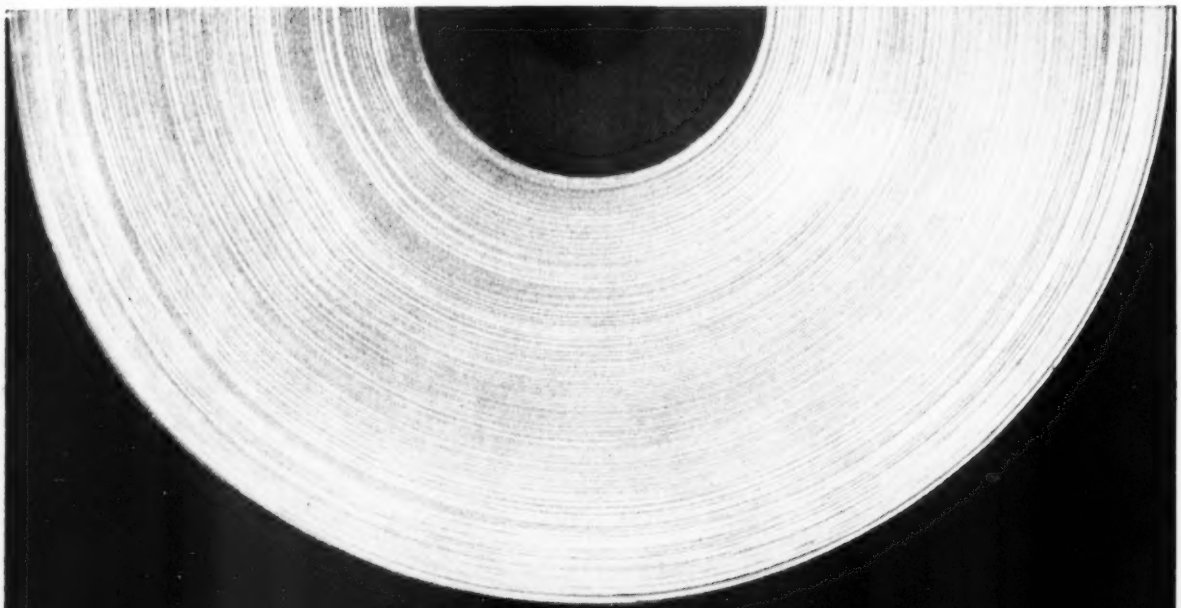

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Paper and Pulp Mill Catalogue

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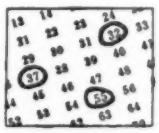

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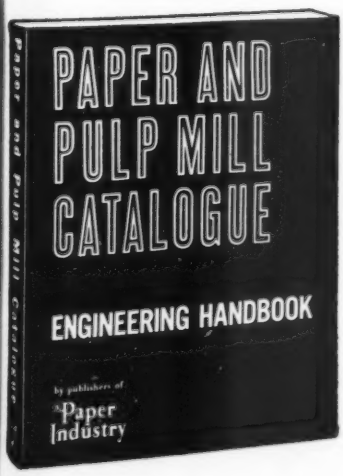

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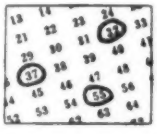

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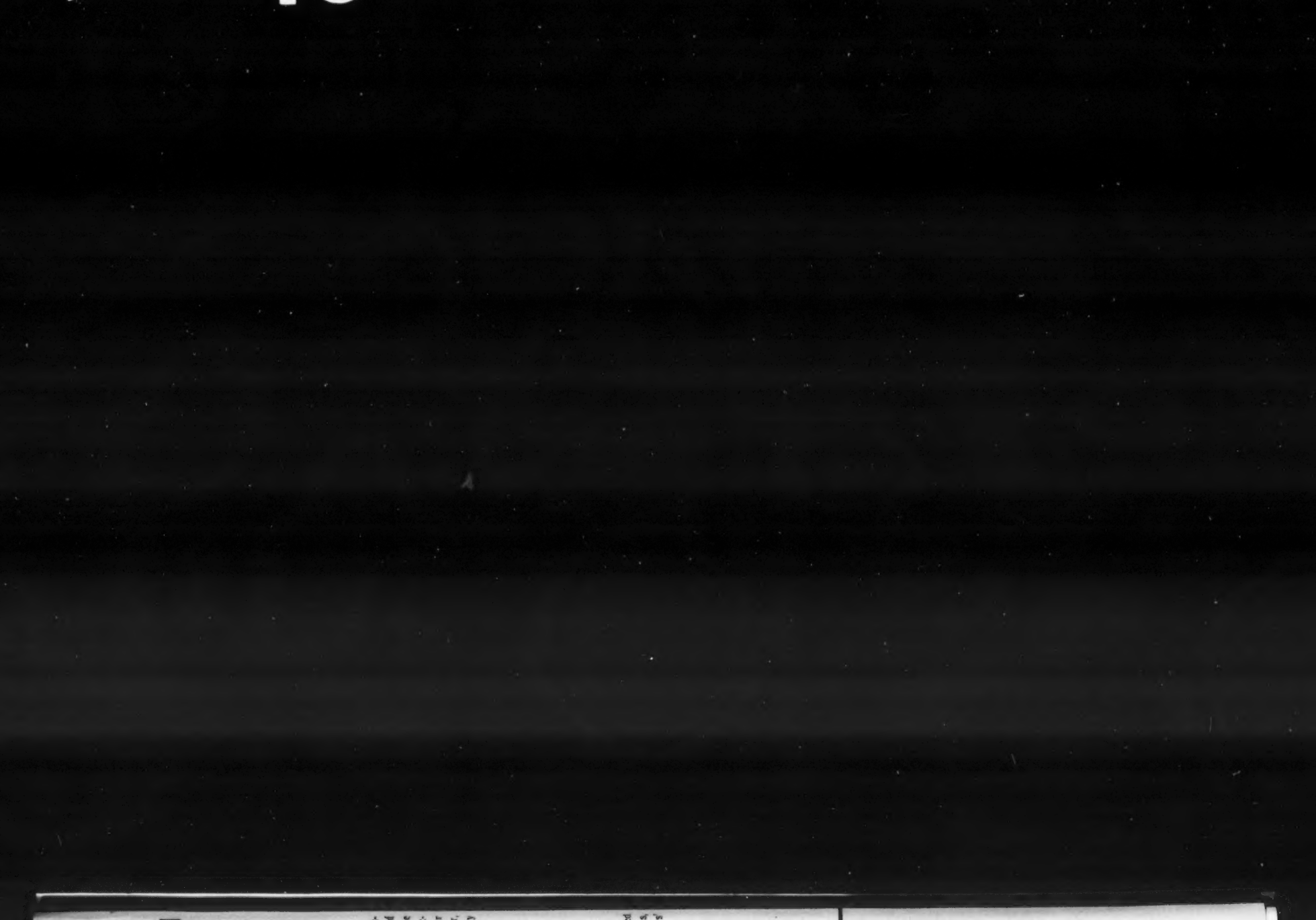

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Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Recording systems

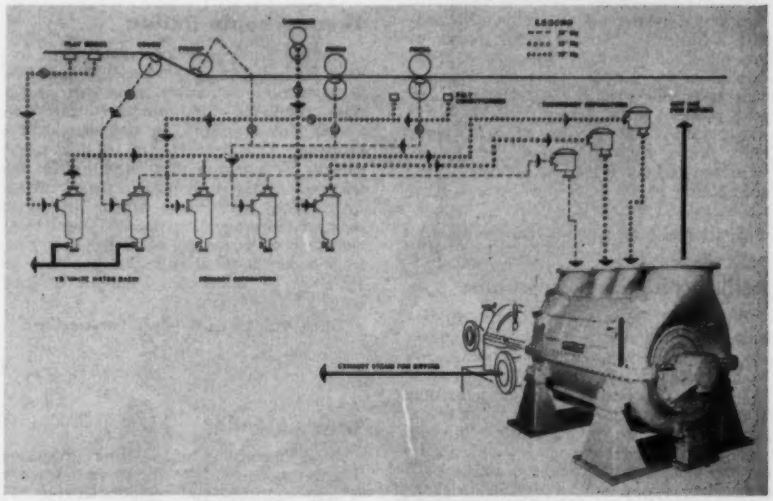
A new line of standard Series 7000 Digital Data Recording and Alarm Scanning Systems for automation of pulp and paper wet processing, is now available. It can be used to scan any process variable that is reducible to electrical form at speeds ranging from those of typewriter readout devices to speeds of presently available magnetic tape recording units. — Monitor Systems Inc.

Circle No. 1 on Readers' Service Card

Paper roll clamp

This new design, all-welded Universal Rotating Roll Clamp for lift trucks up to 15,000 lbs. capacity, features hardened slide bars, to eliminate galling and scoring, full-floating cylinders and hydraulically powered swinging arm. Rolls may be positioned to any degree of rotation, and can be set on either end when tiering and detiering in storage or handling to and from processing areas. Hydraulically adjustable arms assure positive clamping action and allow handling of rolls from 10 to 75-in. in diameter. Models are available for 90, 180 and 270 deg. rotation, or with rigid arm. The clamp will handle any kind of paper. — Little Giant Products Inc.

Circle No. 2 on Readers' Service Card



Vacuum system

A new central vacuum system for handling all the vacuum requirements for an entire paper machine, is said to cut operating cost by more than $25,000. A central centrifugal exhauster with multiple inlets provides vacuum at various levels, and the exhauster can be driven by either electric motor or steam turbine. It is said to do the work of six or more individual pumps.

There are other advantages too. The system has reserve capacity to meet future requirements. The horsepower used is proportional to the actual vacuum capacity required — an advantage inherent in the design of centrifugal compressors. The system conserves mill water and provides for white-water recovery. The single-machine concept reduces spare parts inventory and maintenance. — Ingersoll-Rand Co.

Circle No. 4 on Readers' Service Card

Digital process controllers

A complete line of transistorized digital process controllers for industrial counting, measuring and control applications, is now available. The controllers accurately count pulses from all types of sensing devices to indicate and control various functions of other equipment when a preset count is reached. Standard and special controllers are available to meet the requirements of specific applications such as footage measurement and control for paper converting processes and complete digital program controls for highly automated production lines. — Louis Allis Co.

Circle No. 3 on Readers' Service Card

Paper coating

A new highly reactive material derived from arolein is now being offered for making improved paper coatings. Aldocryl Resin X-12, reacting with starch under certain conditions to form certain substances, is said to make a superior coating for high grade papers. Its ability to react with phenol indicates a potential usefulness in modifying phenolic plastics and resins. The material has a low molecular weight, and is essentially colorless and remains stable in storage. It is completely water soluble and is furnished as a 50 per cent aqueous solution. — Shell Chemical Co.

Circle No. 5 on Readers' Service Card

Tube winder

This tube winder is adaptable for making paper cans, containers, mailing tubes, roll cores, etc. of any length from 1 in. to 76 in. It is said to operate at ribbon speeds over 250 fpm. The machine simultaneously score-cuts both ends of tubes to the precise length. — Dietz Machine Works.

Circle No. 6 on Readers' Service Card

Dry-flow meter

A new device for measuring, by weight, the flow of almost any dry material, is now available. With dimensions of 22-in. in height, 18-in. width

and 11-in. depth, this meter measures flows as small as 5 lbs. per min. The largest measures up to 3500 lbs. per min. The meter is easily installed in existing piping without major alterations. — Industrial Powertronix Inc.

Circle No. 7 on Readers' Service Card

Balemaster hogger

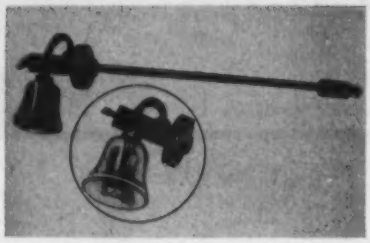
A new 36-in. hogger for paper and paperboard has been developed for applications when moderate hogging capacity is required. Supplied in standard models or units to meet needs of the user for hogging corrugated, boxboard, paper slabs, roll ends and signatures, it is readily adapted for use with present scrap handling and baling equipment. The hogger is complete with pinch table, hogger, motor, exhauster, and control panel all ready for connection to the power source. — East Chicago Machine Tool Corp.

Circle No. 8 on Readers' Service Card

Rolling diaphragm actuator

This RKL Rollomotor is an air-operated, rolling diaphragm actuator which gives fast response to small changes in air pressure. It is used for the sliding stem operation of valves, rheostats, speed reducers, automatic air clamping mechanisms, automatic proportioning pumps and other equipment which can be controlled by a reciprocating motion. Four types are available. — RKL Controls Inc.

Circle No. 9 on Readers' Service Card



Thermocouple fixture

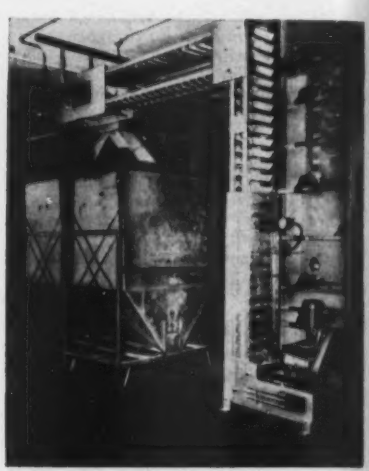
A new non-contact thermocouple fixture for measuring temperatures of objects without touching their surface, is now available. Fine thermocouple filaments are mounted in a bell shaped housing. The heated film of turbulent air at the surface of the object is entrapped in the bell housing and measured. The instrument works at a 15 second response time for 300° and temperature changes of —20° are recorded in 5 seconds. Maximum temperature is 1500° F. — Instronics Division of Jani Inc.

Circle No. 10 on Readers' Service Card

Tank unloader

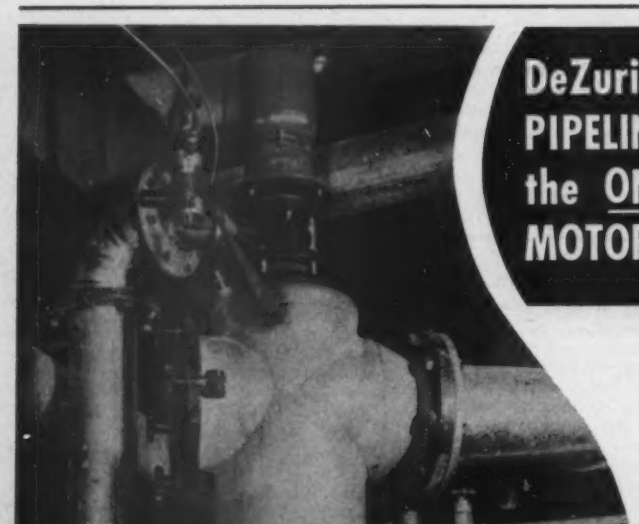
A high density stock tank unloader that enables storage tanks and towers to be unloaded without excessively reducing the density of the stock, has been announced. The equipment consists of a slowly revolving "mining-type" head with integral shrouded nozzle installed at the bottom of the storage tank or tower. Rovalve tank unloaders are available as fully engineered units which are readily adaptable to any paper mill. — W. G. Rovang & Associates Inc.

Circle No. 11 on Readers' Service Card



Bucketglide conveyors

The new bucketglide conveyors, with automatic switchover discharge, fill



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You DO get remarkable accuracy, holding consistency at the amazing level of plus-or-minus .1% or less. All this performance is in a unit that installs right on the pipe, needs no extra space, no extra supports. It operates and records around the clock; stays on the job around the calendar with virtually no maintenance.

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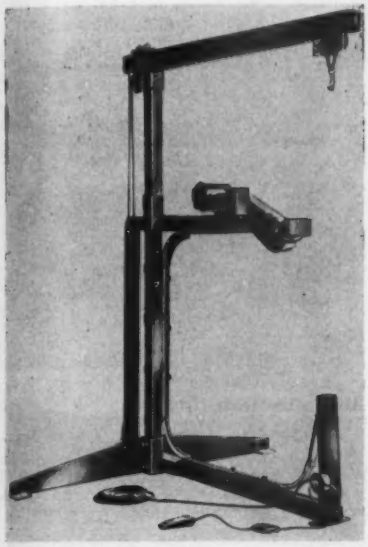
portable storage bins at the rate of 1500 lbs. per hr. The "Bucketglide" feature is said to prevent the buckets from jamming, loosening or falling out. They are available in three standard bucket sizes and are custom built to requirements. — Clermont Machine Co. Inc.

Circle No. 12 on Readers' Service Card



Strap feeder

A new strap feeder, designed to put power in the packaging line, has a clutch which permits controlled feeding of steel strapping from dispenser through the machine and is designed to handle a wide range of package shapes and sizes. Three different models are offered to fit various conveyor heights. Assembly and installation of the feeder is a do-it-yourself operation. — Stanley Works

Circle No. 13 on Readers' Service Card

Electronic flaw detector

An electronic flaw detector and alarm system for paper making machines, is known as "Inspectalarm". It provides immediate warning at the beginning of trouble on a paper machine by recording or marking the position of flaws. It will detect holes, cuts, dirt, discolorations, tears, wrinkles, cut-outs, oil spots and coating skips and will slow down or stop the process in advance of reaching the flaw. It will operate at speeds up to 2400 fpm with maximum sensitivity, and at higher speeds with slightly lowered sensitivity. Play back can run at any speed. — Kohler Coating Machinery Corp.

Circle No. 14 on Readers' Service Card

Thermosetting adhesives

Four new liquid synthetic resin base thermosetting adhesives for bonding copper foil to phenolic or epoxy impregnated base stock, phenolic paper, and epoxy paper in printed circuit manufacture, are now available. Each method of printed circuit manufacture

Continued on page 414

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to get best results on slipsheets or containers for sticky products. Call on Dow Corning — your best source for information and assistance in silicone-coating papers.

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NEW PRODUCTS

Continued from page 413

has been developed to meet each individual manufacturer's requirements. — Minnesota Mining & Mfg. Co.

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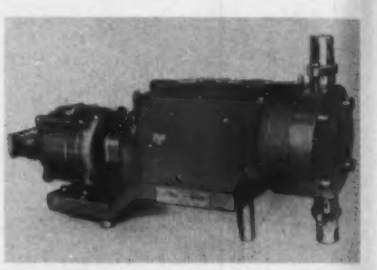


Microflo metering

Pulsafeeder "Microflo LS-3", has been developed for metering chemicals without leakage or contamination, in flow ranges up to 6620 cc per hr. It is available with metal diaphragm, which extends the temperature range and capacity of pumping of high corrosive liquids. This positive displacement pump features a leak-proof design and is adaptable to all methods of semi-automatic and fully automatic pumping. — Process Equipment Division of Lapp Insulator Co.

Circle No. 16 on Readers' Service Card

Slitter-rewinder

The new model 188 doctor machine slitter-rewinder maintains a constant per cent of over-speed through the use of two automatically adjusting drives. Core slippage is controlled 10 per cent regardless of roll diameter build-up and web speed. It operates at speeds up to 2000 fpm and will handle rolls of paper and other materials. — Stamford Eng. Co.

Circle No. 17 on Readers' Service Card

Winding core

A core for winding critical films and papers, including glassine, cigarette paper and thin printing papers, is now available. The core has crush and shear strength and can be manufactured to the customers required strength. A resin bonded blended fibre, the core can be manufactured into lengths up to 100 in. with a diameter to 15 in. — Sonoco Products Co.

Circle No. 18 on Readers' Service Card

Hold-back safety guard

The Possons hold-back safety guard can be used in a variety of applications such as roller mills, pug mills, calenders and shears. The operator wears nylon wrist bands, which are

Continued on page 417

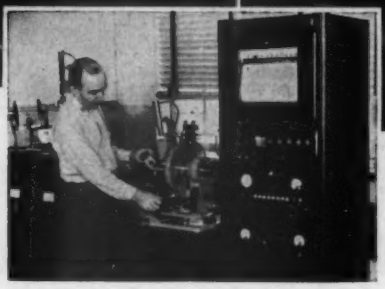
• *Metallurgical examinations are frequent.*

ght Lindsay weaving areas.

• *Wire clot is minutely inspected.*

sonnel seeks tter processes.

sely examined.



• *The wire is examined with a spectograph.*

Paper mills continue to use *Lindsay* wires because—

Lindsay is producing better wires to meet the greater operating demands placed upon them.

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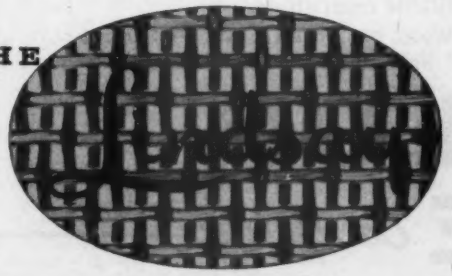
Have you written for a copy of the Lindsay brochure, "Fourdrinier Wires In and For the Paper Industry"?

THE



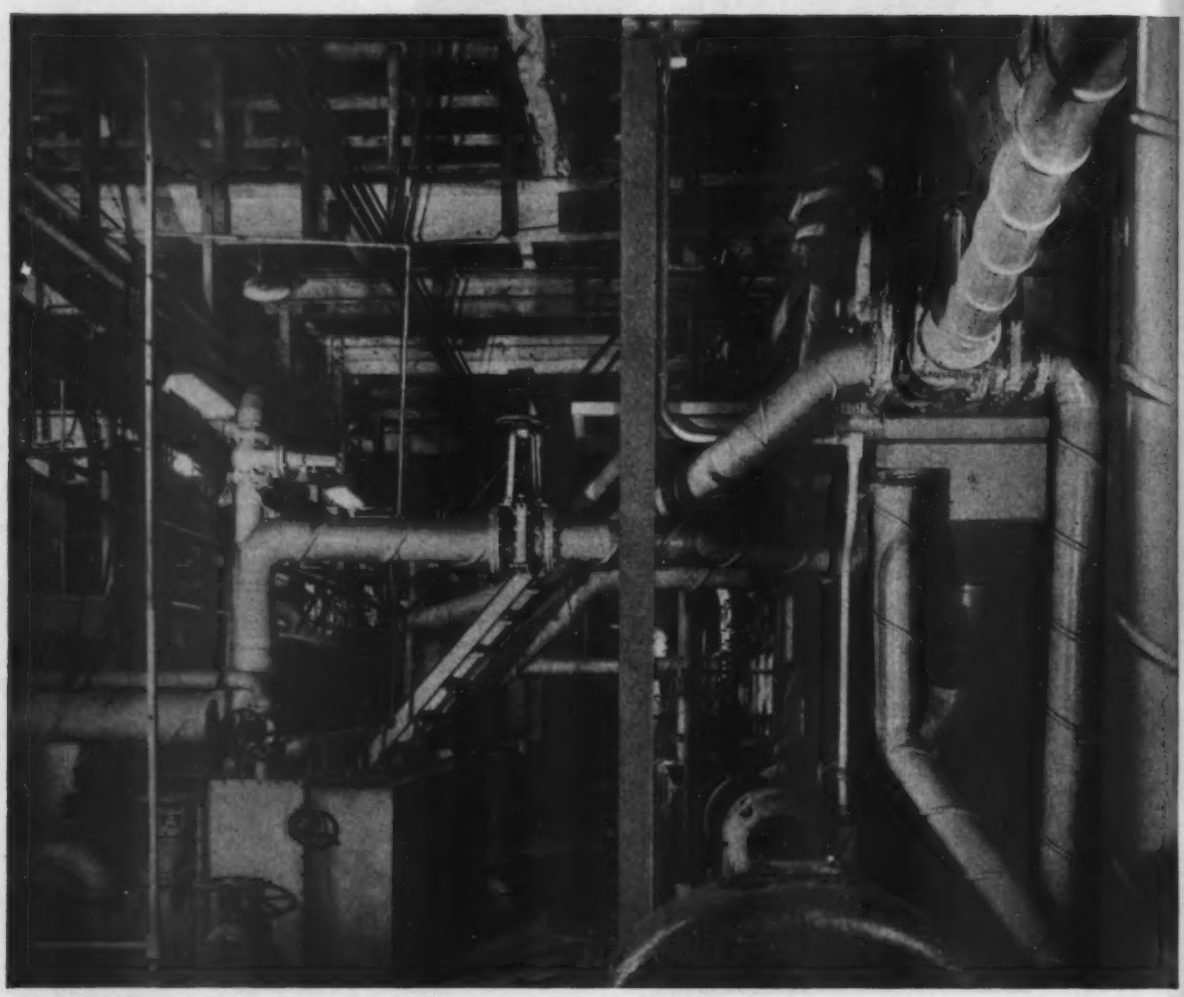
WIRE WEAVING COMPANY

14001 Aspinwall Avenue • Cleveland 10, Ohio

"Quality Fourdrinier Wires Since 1904"

For more data circle 149 on Post Card

Why It Pays to Call on NAYLOR FABRICATION SERVICE for Piping Needs



No matter what you need in pipe, fittings or special fabrications, you'll find NAYLOR fabrication service a dependable source.

NAYLOR can meet your exact specifications whether you require carbon steel, stainless steel, or alloys. Close-tolerance production assures a perfect fit on simple or complex layouts.

Pipe sizes range from 4″ to 30″ in diameter and wall thicknesses from 14 to 8 gauge. Special piping fabrications from 3″ to 44″ in diameter and wall thickness up to ⅜″. Standard fittings are available from stock.

Write for Bulletin No. 59 or send specifications for quotations

NAYLOR PIPE *Company*

1233 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more data circle 150 on Post Card

PHOTOVOLT

Standard Laboratory pH Meter 115

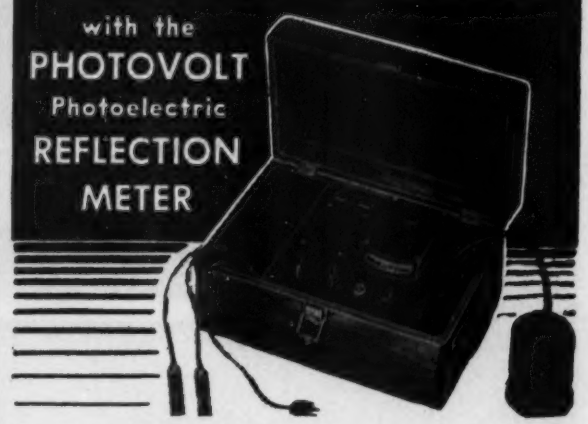
$175 Including Electrodes

WRITE FOR BULLETIN No. 225

A full-fledged pH Meter of remarkable accuracy and stability — simple in operation and maintenance — fast and dependable in service.

PHOTOVOLT CORP.
1115 BROADWAY • NEW YORK 10, N. Y.

You Can Be Sure!
with the
PHOTOVOLT
Photoelectric
REFLECTION
METER



for accurate measurement of
Brightness and Opacity
of pulp and paper in terms of TAPPI specifications.
Also for *Gloss and Color*
tests on paper, card board, and other paper products.
Portable, reliable, rugged, simple to operate
Also: Colorimeters, pH Meters

PHOTOVOLT CORP.
1115 BROADWAY NEW YORK 10, N. Y.

For more data circle 151 on Post Card

NEW PRODUCTS

Continued from page 414

attached to nylon straps. The straps prevent the operator's hands from reaching into any type of danger area. — Positive Safety Mfg. Co.

Circle No. 19 on Readers' Service Card

Chipper knives

A complete line of chipper knives are now available in sizes from 9 to 36 in. long and in widths and thicknesses to customer specification. The new knives, especially developed for the pulp and paper industry, are made of alloy steel and are available with various fork and loop combinations. — United Shoe Machinery Corp.

Circle No. 20 on Readers' Service Card

Film lubricant

"Electrolude", a new air dry solid film lubricant produced for commercial applications, can be applied by spraying, dipping or spray-tumble. It combines corrosion resistance and lubrication in one step and is .0002 in. to .0005 in. thick with a coefficient of friction .025 under high loads. — Electrofilm Inc.

Circle No. 21 on Readers' Service Card

Flexible conveyor

This new power-curve conveyor moves into a boxcar or truck to convey all kinds of packages, and then does the stacking with one man. A series of spring belts operating over grooved rollers that are mounted in hinged frames form the flexible conveying surface. — Power-Curve Conveyor Co.

Circle No. 22 on Readers' Service Card

Antifoam fluid

A new and improved antifoam fluid for industrial use, is a silicone product. It is said not only to quell foam, but prevents foam as well. It is non-volatile and works well at high temperatures. — Silicones Division of Union Carbide Corp.

Circle No. 23 on Readers' Service Card

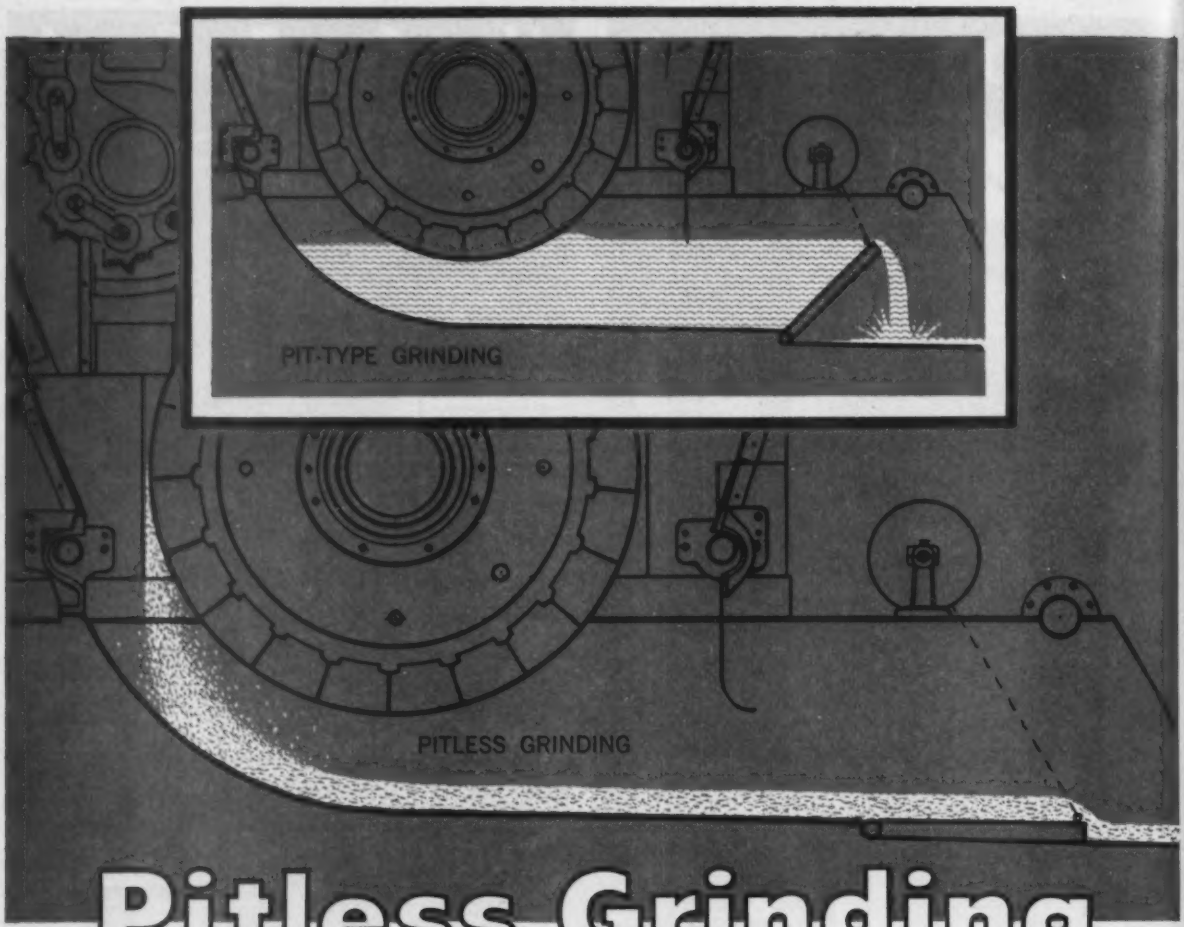
Starch cooker

A new type continuous starch cooker which will operate either full time, or respond automatically to process demands, is now available. The unit is controlled by automatic compressed air valves which start and stop the flow of water, steam, starch slurry, chemicals and additives. It operates within normal industrial utility limits and can be easily modified where exceptional conditions exist. A compact steam generator can be supplied with the cooker. — Corn Products Sales Co.

Circle No. 24 on Readers' Service Card

ROMS Rotating Union
FOR
WATER • CHEMICALS
BRINE • STEAM
−60 Deg. F. to +500 F.
Vacuum to 550 PSI
0 to 3600 RPM
Test our sample in your application before you purchase.
INSTRONICS
11238 S. Western, Chicago, Ill.

For more data circle 152 on Post Card



Pitless Grinding
IS an advantage . . .

Mills report:

- **10% increase in production**
- **Longer stone life**
- **Extended burring cycles**
- **More uniform pulp**

From the beginning, Norton pulpstone engineers have been associated in the development of pitless grinding. They are familiar with the technique and will show you how your present equipment can be adapted to this more efficient, more profitable method. Call Worcester, SWift 8-2511, or Hamilton, Liberty 4-3321.

NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada Ltd., Hamilton, Ont.
Norton International Inc., Worcester 6, Mass.

NORTON PULPSTONES

the world's standard for mechanical pulp

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Non-Slip Floors — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

For more data circle 153 on Post Card

Here's How You Can Train Your Supervisors in...

COMMUNICATION FOR SAFETY

A realistic to-the-point series of 4 films teaches foremen how... by showing them how.

Again... from the National Safety Council... comes another supervisor training series: the all-new COMMUNICATION FOR SAFETY. Here are four films, produced by the same National Safety Council team that has won applause from safety-minded companies across the nation, with: "Safety and the Foreman"; "Supervising For Safety"; "Safety Management For Foremen"; "Speaking of Safety"; and "Human Factors in Safety". Remember — your company's safety program must be carried to your employees mainly by your supervisory personnel. It's up to them to learn the art of communication — not only for safety but to help make their work as supervisors more effective. THE COMMUNICATION FOR SAFETY film series is one way — an economical way—to TEACH THEM HOW BY SHOWING THEM HOW.

Send for further information today!

NATIONAL SAFETY COUNCIL
425 N. Michigan Ave.
Chicago 11, Illinois

Send for free brochure on NSC film series "Communication for Safety"

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

For more data circle 154 on Post Card

NEW LITERATURE

Books

NEW LAWS FOR NEW FORESTS, by Erling D. Solberg. Published by the University of Wisconsin Press, 430 Sterling Ct., Madison 6, Wis. 611 pp. Price: $7.50.

The author, a specialist in rural zoning and land-use regulations for the U. S. Dept. of Agriculture, studies in this book, Wisconsin's forest-fire, tax, zoning, and county-forest laws in operation. The book examines the four related groups of forest-restoration laws and evaluates each group with their related programs. More than 150 figures and tables are used for illustration throughout the book and 90 tables are contained in the appendix.

CHEMICAL PROCESSING NOMOGRAPHS, edited by Dale S. Davis, Professor, Dept. of Pulp & Paper Technology, University of Alabama. Published by Chemical Publishing Co. Inc., 212 Fifth Ave., New York, N.Y. 255 pp. Price: $12.00.

The first chapter discusses how to make nomographs. Consequently, the remainder of the book is a series of nomographs compiled from fifty-two different authors and grouped in categories to form chapters. Topics include: heat, flow of fluids, pulp mill calculations, vapor pressures, solubilities, viscosities, costs, sizing of equipment, conversions, and standard deviations and quadratic equations.

Booklets

"SYNTHETIC AND PROTEIN ADHESIVES FOR PAPER COATING" has just been published by the Technical Association of the Pulp and Paper Industry, New York. The publication is the 22nd in the TAPPI Monograph Series. It is a revision of Monograph No. 9 of the same title published in 1953, and was prepared under the direction of the TAPPI Coating Committee.

THE PACKAGING FUNCTION WITHIN AN ORGANIZATION (Advisory Service Report No. 350), answers questions on packaging organization, decision-making, major trends and related subjects. This is published by the Packaging Institute in cooperation with Modern Packaging magazine.

USDA Reports

LAKE STATES Forest Experiment Station, St. Paul, Minn., is offering Station Paper No. 88, The Forest Insect and Disease Situation, by Gerald W. Anderson and Donald C. Schmiege. The highlights of 1960 on forest insects and the important insect developments, are discussed.

FOREST PRODUCTS Laboratory, Madison, Wis., has published a List of Publications on Pulp and Paper. Bulletin No. 444 lists trade journal articles, Federal Government bulletins and technical notes.

Manufacturers' Publications

Copies of these publications are available at no obligation through our Readers' Service Department. Use the reply card which accompanies this issue when requesting items.

Shutdown wall chart

Westinghouse Electric Corp. is offering a "Shutdown Master Planner" wall chart. The two-color preplanner chart facilitates scheduling of equipment shutdown maintenance activities. All items involved in the shutdown are shown at a glance, and space is provided for listing time and manpower requirements.

Circle No. 25 on Readers' Service Card

Catalog equipment index

T. B. Wood's Sons Co. is offering an eight-page bulletin titled "Mechanical Power Transmission Equipment". This is a condensed catalog of their products and an index to the company's trade literature. Each product or product line description is concluded with reference to a separate bulletin for detailed information.

Circle No. 26 on Readers' Service Card

Silicone antifoam agents

Hodag Chemical Corp. is making available an eight-page, illustrated booklet describing the suitability of their product for industrial foaming problems. Prescribed levels for their use are given in comprehensive tables of properties. The data tabulated is useful in the selection and application of silicone antifoam problems encountered in both aqueous and non-aqueous systems.

Circle No. 27 on Readers' Service Card

Glassed-steel equipment

Pfaudler Co., division of Pfaudler Permutit Inc., has published a new six-page bulletin describing the advantages of Glasteel as a material of construction for chlorine dioxide generating plants. The opening section of the bulletin describes the physical, chemical and economic characteristics which suit Glasteel for this application. The final section describes the services available for plant design, specification and start-up.

Circle No. 28 on Readers' Service Card

Proportioning liquids

B-I-F Industries has just issued "It's A Fact" data on the problem of proportioning liquid to solid ingredients, such as peroxide bleach solution to woodpulp for bleaching. The two-page data sheet and accompanying

bulletins contain illustrations, schematic diagrams dimensions and a thorough description of the operation, and uses of B-I-F equipment for proportioning applications.

Circle No. 29 on Readers' Service Card

Web-fed converting equipment

Champlain Co. Inc. is offering a 216-page catalog on the company's entire line of web-fed printing and converting equipment with detailed specifications. Described are: unwind stands, rewinds, fabricating equipment, web processing equipment and electronic controls.

Circle No. 30 on Readers' Service Card

Buyer's guide

Pfaudler Permutit Inc. has published its 1962 Buyers Guide for all industries which handle or process liquids or gases. The 16-page bulletin is divided into the products of the two sections, Pfaudler and Permutit. Included are engineering data in chart or tabular form, materials of construction, and illustrations.

Circle No. 31 on Readers' Service Card

Resin latex

National Starch & Chemical Corp. is offering a technical brochure describing the recently introduced self-reacting resin latex, X-Link 2833 for use in paper saturation. The brochure provides the prospective user with information on the material's general properties, formulation and applications.

Circle No. 32 on Readers' Service Card

Industrial gloves

B. F. Goodrich Industrial Products Co. is offering a guide to the selection of industrial gloves for handling nearly 400 different chemicals in the form of an eight-page illustrated catalog. Included in the publication is a performance chart which rates the comparative wear and chemical resistance to neoprene, neoprene-coated, Koroseal-coated and rubber gloves.

Circle No. 33 on Readers' Service Card

Cushion couplings

Dodge Mfg. Corp. is offering a 24-page bulletin on their expanded line of Para-flex cushion couplings. Product photos, engineering drawings and actual installation pictures are included with descriptions of standard, high speed, and flywheel types of Para-flex. Other data includes horsepower ratings, dimensions, prices and weights.

Circle No. 34 on Readers' Service Card

Material handling manual

Globe Hoist Co. is making available a new material handling manual: "Case Studies in Modern Lift-portation". Profusely illustrated with photos, drawings and specifications, this 24-page book features 59 ways to lift, load, position and machine feed more efficiently. Applications cover 21 industries, including paper manufacturing.

Circle No. 35 on Readers' Service Card

Ceramic cones

Bauer Bros. Co. is offering a bulletin describing the ceramic cones for high-velocity Centri-Cleaners. The literature pictures various cones available and the complete line of Centri-Cleaners.

Circle No. 36 on Readers' Service Card

Plastic extruders

Dilts Division of Black-Clawson Co. has published a bulletin on equipment for plastic extrusion coating. It illustrates the various models of Aetna-Standard plastic extruders, dies, and auxiliary equipment which is now being designed and manufactured by this company.

Circle No. 37 on Readers' Service Card

Fluid drives

Dodge Mfg. Corp. is offering a 20-page bulletin on a simplified method for selecting Flexidyne Dry Fluid Drives and Couplings for industrial applications. It explains operating advantages, and includes tables of weights, dimensions and prices.

Circle No. 38 on Readers' Service Card

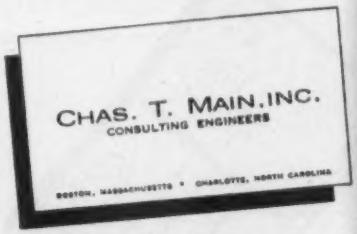
Process heat exchangers

Whitlock Mfg. Co. is offering a four-page bulletin on process heat exchangers for the pulp and paper industry. White water heaters, digester flash condensers, rosin paste heater and the chlorine vaporizing system are pictured and described.

Circle No. 39 on Readers' Service Card

Professional and Business Services

Engineering for the PULP and PAPER INDUSTRY



Save Man Hours

Equip Your Digester House with a

HUMPHREY

Employee's Manlift

ELEVATOR

Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.

Can be installed in any Multi-Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY

Inc.

347 1st Ave. N.W.

Faribault, Minnesota

Humphrey is the original Manlift Elevator, made continuously since 1887.

For more data circle 155 on Post Card

PNEUMATIC CHIP SYSTEMS

ARCHER HIGH PRESSURE PNEUMATIC CONVEYING OF PULP CHIPS OR OTHER MATERIALS—BARK, SAWDUST, HOGGED WOOD, ETC.

Call

PORTLAND 1, ORE.
6141 S.W. Macadam Ave.
CHerry 6-3308

2 PLANTS

SEATTLE 8, WASH.
9500 E. Marginal Way
PArkway 5-4003

ARCHER BLOWER AB PNEUMATICS SYSTEMS

Archer Blower & Pipe Co., Inc.

SINCE 1900

CLASSIFIED ADVERTISING

ANY SPARE TIME?

Make your paper mill knowledge add to your income. No selling. Confidential. Write Box 710, The Paper Industry.

ADHESIVES in the PAPER INDUSTRY
Compiled and edited by A. W. J. Dyck, Ph.D.
Price $2.00 prepaid with order
Published by FRITZ PUBLICATIONS, INC.
431 S. Dearborn Street, Chicago 5, Illinois

CHEMIST OR CHEMICAL ENGINEER

Leading paper board manufacturer has an excellent opportunity in the Midwest for a young chemist or chemical engineer with 2 to 5 years experience in coatings or paper board.

Must have personality to meet customers and ability to supervise people.

Please outline experience and personal history.

Write Box 716, The PAPER INDUSTRY

WANTED — Surface winder to handle 45 to 60 diameter rolls, 78" wide. Write Box 717, The PAPER INDUSTRY.

SALES ENGINEER

We have an opening for a young, aggressive engineer interested in Technical Industrial Sales. Position requires sales contacts and engineering for air handling systems and heavy equipment. An engineering degree, or equivalent, and ability to work with customers at upper levels of Engineering and Management are basic prerequisites. Position is with a young, fast growing organization located in Wisconsin's Fox River Valley. Must be willing to relocate near Neenah, Wisconsin.

Resume should include complete personal and professional qualifications and present salary.

Reply Box 468, Neenah, Wisconsin.

PRODUCTION MANAGER
FOR MAJOR PAPER MILL

Challenging position for individual with 8 to 10 years diversified experience in the manufacture of groundwood paper. He will be responsible for the coordination of all production and technical activities and must have the ability to generally assist our Resident Manager in the administration of a multi-machine paper mill located in Northeast U. S. Administrative and supervisory ability as well as technical knowledge of paper mill operations essential.

Salary commensurate with ability and experience.
PLEASE SUBMIT RESUME TO
P.O. BOX 40, GRAND CENTRAL STATION
NEW YORK 17, N. Y.

WILLIAMS-GRAY COMPANY
221 North LaSalle Street
Chicago 1, Illinois

Serving the Paper Industry

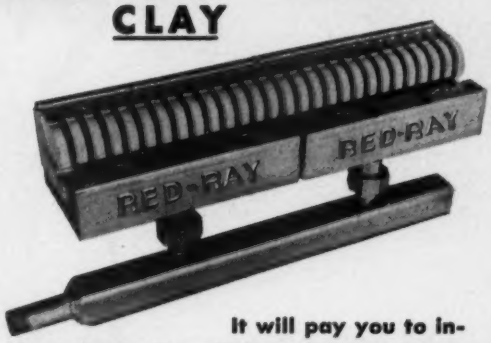
Paul Foster • Peter Talbot
Herb Fishburn • Wes Gallup • Bill French

Lindsay Wires
Knox Woolen Felts
Mount Vernon Dryer Felts
Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

For more data circle 156 on Post Card

DRYING...

PAPERS • COATINGS
SILICONE • LATEX
CLAY



It will pay you to investigate the efficiency and economy of the new RED-RAY Type "H" Burner, latest development of RED-RAY infra red drying experience.

Write for further information to:

RED-RAY MFG. CO., INC.
318 CLIFF LANE • CLIFFSIDE PARK, N. J.
Tel.: WHitney 3-1000

For more data circle 157 on Post Card

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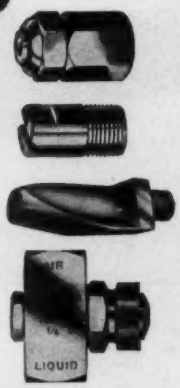
from tree to paper
SPRAYING SYSTEMS CO.

SPRAY NOZZLES



will help lower your costs

For every operation in spraying, from the heavy impact needed in debarking to the exactly controlled volume, distribution and spray angle essential in web spraying . . . Spraying Systems spray nozzles offer many advantages. Choice of capacities and selection of types is far greater in range . . . exclusive design features result in better performance. For complete information write for Catalog 24.

SPRAYING SYSTEMS CO.
3254 RANDOLPH STREET
BELLWOOD, ILLINOIS

If you have a special problem, write and let us know. Data Sheets are available covering a wide range of applications . . . or a field sales representative will be glad to call.

For more data circle 158 on Post Card

APPLETON WIRE WORKS, Corp.

Plants at Appleton, Wisconsin and Montgomery, Alabama.
International Wire Works, Menasha, Wisconsin,
an Affiliated Company.

For more data circle 139 on Post Card

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt
No. 1 white shirt cuttings	10.00— 10.50
Soft unbleached muslins	13.50— 14.00
Fancy shirt cuttings	2.00— 3.00
No. 1 percales	4.00— 5.00
No. 1 washables	2.00— 2.25
No. 1 light silesias	6.50— 7.00
Light flannelettes	5.50— 6.00
Cotton ades	2.25— 2.50
Blue overall cuttings	5.00— 5.50
Blue cheviots	6.75— 7.25
Canton flannels, bleached	9.00— 10.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	8.50— 9.00
Underwear cuts, bleached	10.50— 11.00
Underwear cuts, unbleached	10.50— 11.00
Sun tan khaki cuttings	5.00— 5.50

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York.

	per cwt.
No. 1 roofing (Chicago)	.65— .70
No. 2 roofing (Chicago)	.55— .60
Twos and blues, repacked	2.00— 2.25
Thirds and blues, repacked	1.50— 1.75

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	85.00— 90.00
No. 1 hard white shavings	70.00— 75.00
No. 1 soft white shavings	45.00— 50.00
Soft white shavings, uncoated	55.00— 60.00
Fly leaf shavings No. 1	17.00— 22.00
Fly leaf, woody, No. 1	17.00— 20.00
Mixed colored shavings	16.00— 18.00
No. 1 books and magazines	13.00— 15.00
Ledger stock, white, No. 1	40.00— 45.00
Ledger stock colored, No. 1 (Midwest ship)	27.50— 30.00
New manila envelope cuttings (free of groundwood)	50.00— 55.00
New manila envelope cuttings (containing groundwood)	40.00— 45.00
Manila tab cards	50.00— 55.00
Colored tab cards	40.00— 42.50
New northern kraft envelope cuttings	50.00— 55.00
Triple sorted kraft, 100%	30.00— 32.50
No. 1 old kraft	22.50—
White news cuts, No. 1	40.00— 45.00
No. 1 overissue news	17.00— 19.00
Folded news, special	13.00— 14.00
Folded news, ordinary	11.00— 12.00
Old corrugated boxes	19.00— 20.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	5.00— 7.00
No. 1 mixed paper	3.00— 7.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.80—
Lump, drums, works, cwt.	5.55—
Powdered, drums, works, cwt.	5.70—
1-Arginine, drums, kilo	60.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
Imported, 30M Argentine, ex-dock, c. l., lb.	.18½—
30M N.Z. Lactic, ex-dock, c. l., lb.	.25—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	11.00— 17.00
300-mesh bags, c.l., Georgia works, ton	13.50— 22.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	23.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined	
(CP, USP) 99% drums c. l., delivered lb.	.26⅜—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb	.13¼—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	13.00—
N	13.05—
WG	13.15—
WW	13.25—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	11.00— 12.25
N	11.25— 12.35
WG	11.50— 12.55
WW	11.75— 12.85
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	6.73—
Pearl, 100-lb. bags, cwt.	6.58—
Powdered, 100-lb. paper bags, cwt.	6.78—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb	.12½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.14—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	140.00—
Bleached sulfite, Canadian	140.00—
Unbleached sulfite, Canadian	125.00—
Bleached soda	130.00—135.00
Bleached soda, Canadian	130.00—135.00
Kraft, bleached hardwood	135.00—140.00
Kraft, bleached	145.00—150.00
Kraft, bleached Canadian	150.00—
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, semi-bleached southern	130.00—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	140.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	140.00—
Bleached sulfite, Finnish, freight allowed	140.00—
Unbleached sulfite, Swedish, freight allowed	125.00—130.00
Unbleached sulfite, Finnished, freight allowed	125.00—130.00
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft bleached Swedish, Freight allowed	150.00—155.00
Kraft, bleached, Norwegian	150.00—155.00

PAPER

Quotations are mill quotations Chicago

Book Paper (f.o.b. Chicago, c.l. skids per cwt):	
No. 1 enamels	20.80
No. 2 enamels	19.80
Machine-coated, 45- to 100-lb.	15.55— 19.00

Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials

Knox Felts
KNOX WOOLEN COMPANY
CAMDEN, MAINE
America's First Manufacturer of Endless Paper Machine Felts

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DICALITE® TECHNICAL REPORT

DICALITE DEPARTMENT • GREAT LAKES CARBON CORPORATION • 612 SO. FLOWER ST., LOS ANGELES 17, CALIFORNIA

New Dicalite BULK-AID TRADEMARK for Paper Products

Dicalite BULK-AID is a new development in inorganic fillers, with particle size range and distribution carefully controlled to give maximum bulking characteristics in paperboard and paper products. BULK-AID has the lowest apparent or bulk density of any known mineral filler for papermaking use, thus providing required caliper at lower weights. One example is that of a 40-point groundwood sheet whose weight was reduced from 29.2 lbs/ft³ to 27.3 lbs/ft³ by the addition of 10% BULK-AID.

The light weight and bulking characteristics of BULK-AID make it especially suitable for use in paperboard; its high brightness and excellent retention are also of considerable value. BULK-AID lowers the furnish cost and increases pulp mileage in top liners for patent white paperboards. Its brightness and opacity raise the quality of underliners at the same time it extends the furnish.

Dicalite BULK-AID is an amorphous mineral, technically an aluminum silicate, produced from a volcanic mineral known as perlite by a special process developed by Great Lakes Carbon Corporation. BULK-AID is inert, insoluble in water, acid or mild alkalies. It is grit-free, and exhibits no reaction with alum in sizing or with other papermaking chemicals. It is readily dispersed in any furnish, does not cause foam, and will not fill felts.

Among BULK-AID's physical characteristics are these:

Color: White

Average G.E. Brightness: 83

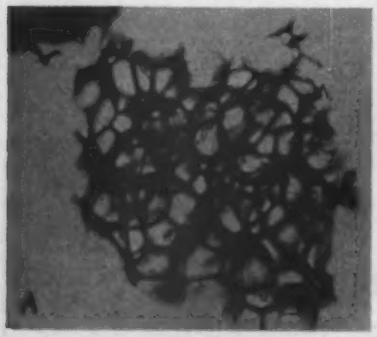
Loose weight: 4½ lbs/ft³ average

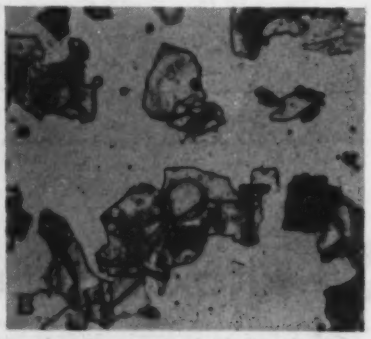
Bulk densities in paperboard: 15 lbs/ft³ average.

Particle size: 80% less than 10 microns

Extensive testing has shown BULK-AID to be successful in actual paper mill production. Most of these tests were on cylinder machines for paperboard production, but limited tests indicate its value in many slow speed fourdrinier applications.

Your Dicalite engineer will be glad to discuss BULK-AID with you and to advise on possible product applications in your own plant.





When perlite is crushed and then suddenly heated to the proper point in its softening range, it pops like corn into particles like that shown in photomicrograph A, containing a myriad of microscopic sealed cells. The size of the original particle and the application of heat are both important, and are critically controlled. This is the expanded material from which BULK-AID is produced. Controlled milling and air classification by an exclusive Great Lakes Carbon Process are the major steps in making BULK-AID, typical particles of which are shown in photomicrograph B.

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Gordon G. Halvorsen

DICALITE'S "MAN ON THE SPOT"

The development of Bulk-Aid, to meet the industry's need for an extremely low density bulking agent, was initiated by Gordon Halvorsen, Product Sales Manager for Dicalite, and he has been closely identified with its tests and product application work from the beginning.

Halvorsen has an extensive background in research and development work, beginning with his graduation from the University of Minnesota with a degree in Chemical Engineering. Prior to joining Great Lakes Carbon in 1940, Gordon had been engaged in technical and laboratory work in the pharmaceutical, corn processing and water treatment fields, and continued his research work in the Dicalite product laboratories for the first 5 years of his association.

Halvorsen is the author of several technical papers, and has contributed to both paper industry and brewing publications. Among his technical society memberships he lists TAPPI, American Society of Sugar Beet Technologists, Master Brewers Association of America, and others in the brewing and drycleaning fields.

NEW DATA SHEET

on Dicalite *BULK-AID* gives more complete information on physical and chemical properties, and on its advantages in papermaking. Write for your copy to Dicalite Dept., 612 So. Flower St., Los Angeles 17, Calif.

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HOLYOKE, MASSACHUSETTS

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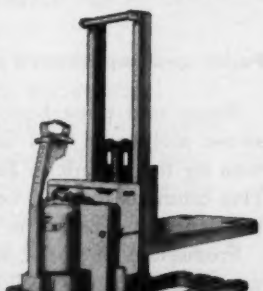
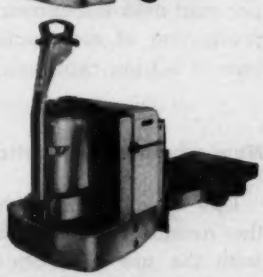
NEW BARRETT ELECTRIC PLATFORM LIFT-TRUCKS

HI

Unequaled for stacking skids or platforms in close quarters. Features push-button lifting and lowering as well as fingertip speed control. Many combinations available. Ask for Model HPG Bulletin No. 593.



Handle more skids faster at less cost with this push-button-controlled low-lift truck. Features *single-frame construction*, full 6-in. lift, high underclearance. Ask for Model PG Bulletin No. 591.



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FIRST IN AUTOMATED MATERIAL HANDLING

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whither?

in production
processes
new products
markets

Penton-lined equipment

Pipe and fittings lined with extruded Penton chlorinated polyether has been introduced by Dow Chemical Co. The extruded Penton liners are 5/32 to 9/32 in. thick. The equipment has been successfully tested in piping systems carrying 45 per cent sulfuric acid at 45 psi and 176° F; calcium chloride brine containing free HCl at 280° F and 75 psi; 70 per cent HF at 100° to 179° F; ammonium chloride solution at 200° to 240° F, etc.

The cost of the equipment is comparable to that of stainless steel, with installation costs, however, considerably reduced. The pipe is available in the size range of 2 to 8 in.

Paper and paperboard production up

Paper and paperboard production in the first seven months of 1961 is estimated at 20,196,000 tons by the American Paper & Pulp Association. This amounts to a 0.4 per cent increase over the corresponding period in 1960.

Production of paper was 9,013,000 tons or 0.4 per cent below the 1960 January-July output; production of paperboard was 9,348,000 tons or 1.3 per cent over the corresponding 1960 output; and production of construction paper was 1,835,000 tons or 0.3 per cent below the 1960 period.

New advances in plastic fourdrinier fabrics

Due to a recent technological breakthrough, the need for take-up equipment in connection with the use of "Formex" fabrics on the fourdrinier has been eliminated. Take-up equipment which was needed until 1960, included in most cases three Mount Hope bowed rolls and a stretch mechanism similar to that used on the press section for felts.

On 9-point corrugating media and coarser grades, the "Formex" fabric can now be used without such take-up equipment. On finer paper grades, the installation of a stationary bowed stainless steel pipe in the return section before the breast roll is recommended to preclude the appearance of any ripples in the forming area.

Refuge from flames

Forest fire fighters can now make use of cone-shaped shelters developed by USDA's Forest Service. The shelters, weighing individually less than 2¼ lbs., protect their occupants from intense outside radiant heat which may be as high as 600° F. The shelter is made of aluminum foil with fire-resistant cotton scrim and paper backing. The foil reflects radiated heat while the scrim and paper provide strength and insulation.

The shelter has a slit near the top for observation and for ventilation. Two loops attached to the inner surface enable the occupants to move the shelter or to steady it against the force of wind.

It is reported that a volunteer stayed in one of these shelters for 31 min., without much discomfort, while the temperature of the surrounding fire reached a peak of 600° F.

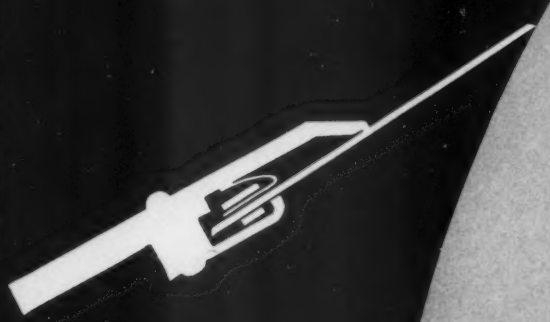
Rigid urethane foams derived from crude tall oil

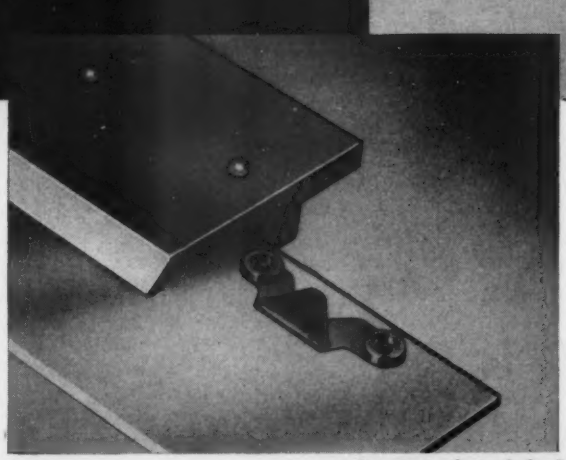
Crude tall oil has been used in the preparation of rigid urethane foam containing as much as 40 per cent tall oil. This significantly reduces raw material costs in urethane foam production, it was reported at the 140th ACS Annual Meeting. These foams, produced from a select mixture of crude tall oil, a crude form of 4,4'-diphenylmethane diisocyanate, certain nitrogen-based polyether polyols, flurocarbon blowing agent and foaming stabilizer show low thermal conductivity and excellent dimensional stability under various condition of temperatures and humidity.

New method of laminating polyurethane foam to papers and plastic film

The method, developed by Sterling Alderfer Co., simultaneously bonds the polyurethane foam to the sheet as the foam is skived in continuous yardage lengths from the foam log. Immediate bonding is said to give the laminated material strength and durability for easier handling and makes possible the use of lighter and thinner layers of foam. Foam thicknesses as thin as 30/1000 in. have been produced with the method.

Lodding Doctor Blades *have been "through the mill"*





Lodding puts every doctor blade through the mill before it reaches you. And in paper mills throughout the world, there are Lodding Blades in every doctoring operation. Figuratively and literally, Lodding Doctor Blades have been "through the mill."

But blades alone are no guarantee of effective doctoring. This is achieved only through experience in the design, manufacture and assembly of *all* doctor components. And no other manufacturer has more experience than Lodding in the design and manufacture of doctors for every application and operating condition. Our more than 30 years of specialization in the field of doctoring is your assurance that when you order doctors or replacement blades from Lodding, you're getting the best that are available.

Lodding Doctor Blades can be supplied in HIGH CARBON STEEL, STAINLESS STEEL, K MONEL, PHOSPHOR BRONZE, or in a wide variety of LAMINATED PLASTIC, THERMO PLASTIC or ABRASIVE materials — whatever is best suited for your particular requirements.

BLADE SURVEY SERVICE

Without charge, a Lodding representative will conduct a complete study of all your doctoring applications and make specific recommendations on blade materials and on operating procedures. Generally, when mills have taken advantage of this service, it has resulted in greater operating efficiency and economy. You, too, can profit from Lodding's 30 years of specialized experience. Call or write your nearest Lodding sales representative for details.

LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS

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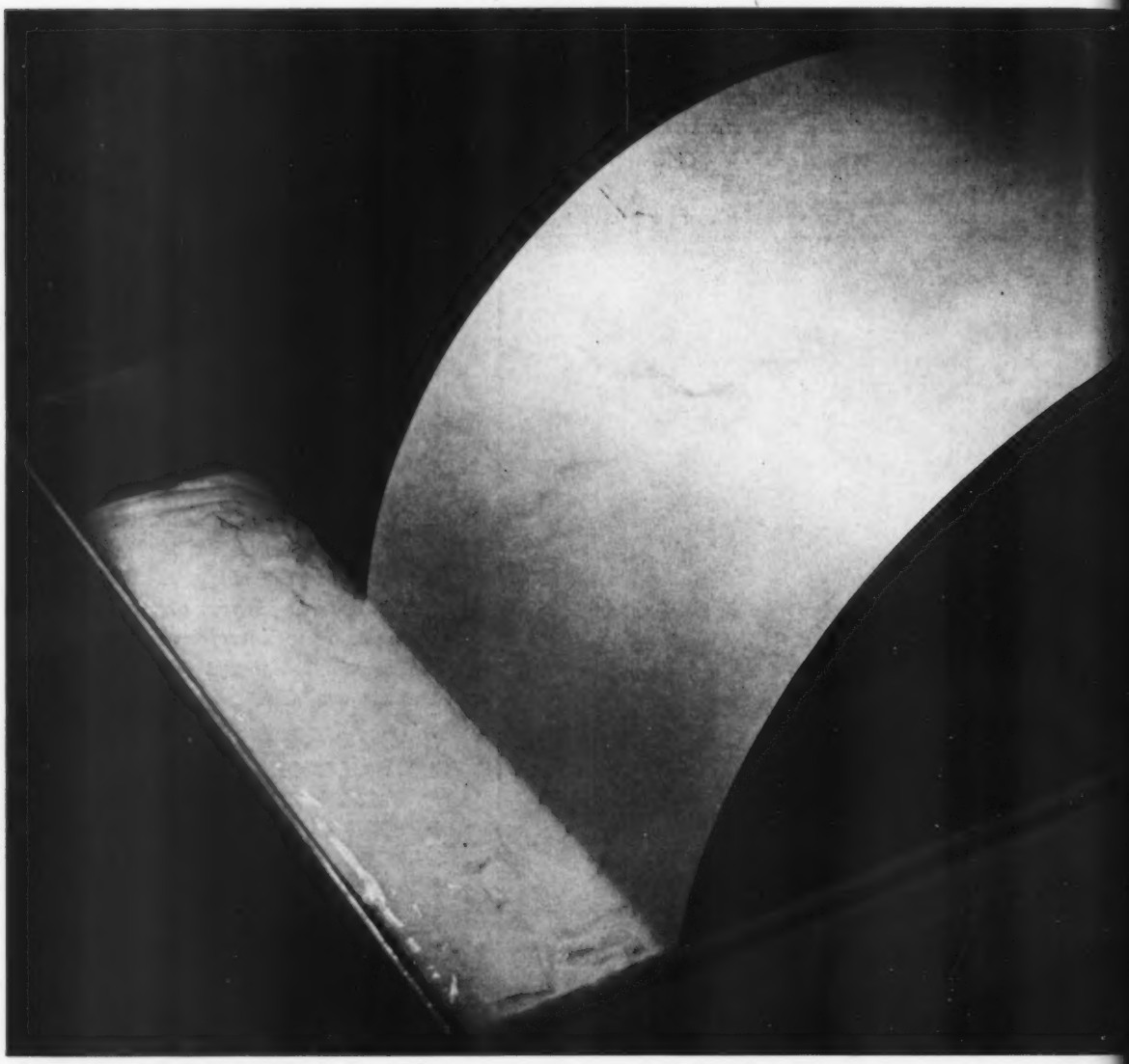

Want to know what your paper would look like coated?

Georgia Kaolin's Sales Service Department operates pilot plant trailing blade, air knife and roll coaters. Many paper mills have found these facilities very helpful in determining the effects of different coating methods and formulations on their own raw stock.

G-K's research personnel and facilities are also being used by many companies both large and small, for assistance in other areas such as clay handling, clay make-down, filling techniques, coating color formulation and preliminary runs and evaluations of new products.

These facilities are at your disposal . . . can be a valuable supplement to your research and development studies.

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